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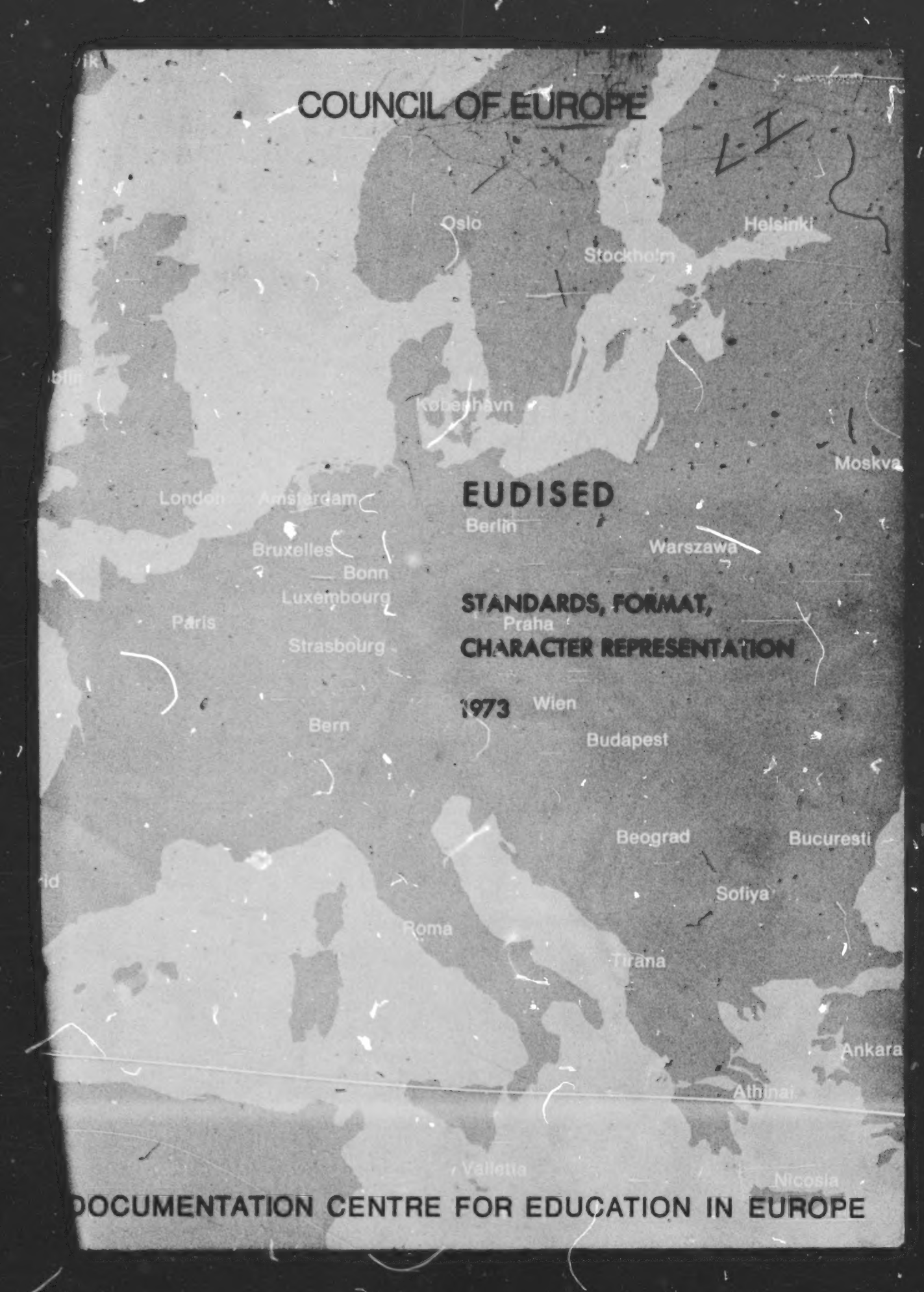
ABSTRACT

Part of a larger effort in creating a computer-based European Documentation and Information System for Education (EUDISED), the present document is the report of the Working Party on formats and standards. It presents draft recommendations on general system standards: transmission standards (interchange format, magnetic tape standards, tape labels and character representation), bibliographic standards (cataloging standards, filing rules, classification and indexing systems), code standards, format implementation standards and aspects of network development. Two papers present additional detail on certain aspects of the proposed system: "Draft EUDISED Format" by John Linford and "Character Set and Character Representation for the EUDISED Network" by R. Bernhardt. (Author/SL)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STANDARDS, FORMAT, CHARACTER REPRESENTATION

1973

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INTRODUCTION

This volume, the sixth to be published in the EUDISED series, bears witness to the remarkable advances that have taken place in the standardisation of mechanized bibliographical techniques in recent years. If we look back five years to the meeting, convened by the Secretariat, of experts from member states in which experiments concerning the application of computer techniques to educational documentation and information were then being planned or already under way, we recall them drawing attention to the fact that widely different systems and technologies for mechanized indexing, classifying, storage and retrieval were being developed. The experts underlined that once the application of such systems and technologies had involved major investment in computer programs and equipment it might be found impossible to change them. This was the origin of the EUDISED project, and in fields other than education similar conclusions were being, or had been drawn.

Work therefore proceeded on co-ordinated development of the application of new documentation techniques in a diversity of separate fields, and subject-oriented information interchange systems were built up. Happily, in the construction of each of the various systems due account has been taken of work being done elsewhere, since it would have offended logic, as well as being wasteful of effort, if individual systems had been designed with disregard for the possibilities of inter-system convertibility. Although this result may partly have been due to the relatively small number of experts to whom it is possible to turn for advice, most of the credit, and a great debt of gratitude, must go to such bodies as ISO, IFLA and UNESCO for their efforts to secure common agreement on the core around which the individual systems can be constructed.

Another noteworthy feature of the background against which the contributions to this volume were written is the rapidity with which advances are being made in the field of standards for automated bibliography. Thus while it is earnestly hoped that the volume can make a useful contribution to ongoing activities in this field, it has been felt necessary to record the dates at which the drafts were finalised.

The expert members of the Working Party were called upon to complete their task within the very short period of one year. Their response to this call reflects upon them the greatest credit, and our thanks are particularly due to the Chairman of the Working Party, who prepared its final report, and to the authors of the two other papers in this volume, Mr. Linford and Mr. Bernhardt. Our thanks are also due to Mr. Michael Gorman, London, and to the many other contributors whose aid was invaluable in the preparation of these texts.

We also acknowledge our gratitude to the several international and national bodies that have been associated with the activities of the Working Party, in particular to the ISO Central Secretariat, the Commission of the European Communities at whose invitation the third meeting was held in Luxembourg, and, not least, UNESCO who provided the vital link, so important to the future, with the UNISIST project.

In submitting the report of the Working Party on EUDISED Formats and Standards to the ad hoc Committee for Educational Documentation and Information, the Secretariat reiterates the point made by the Working Party itself to the effect that the contents of this volume do not constitute the detailed instruments which will be required in an operational network. In this respect they differ from the Multilingual EUDISED Thesaurus, which has been elaborated concurrently, in English, French and German, and which is published separately. They do, however, bring the EUDISED project very much closer to the ground than might have been hoped in so short a space of time; so close in fact that the key institutions that will form the core of the proposed network must now be identified and become engaged in working out the detailed technical specifications required for the implementation of these broader proposals.

Strasbourg, October 1973

Niels BORCH-JACOBSEN
Director of Education and of
Cultural and Scientific Affairs

REPORT OF THE WORKING PARTY ON EUDISED FORMATS AND STANDARDS

prepared by

RICHARD COWARD
The British Library
London
Chairman of the Working Party

July 1973

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REPORT OF THE WORKING PARTY ON EUDISED FORMATS AND STANDARDS

PART I: ACTIVITIES AND RECOMMENDATIONS

Introduction

The efficient transfer of information about educational research, educational systems, methods and services, is now recognised as of vital importance in the general development of educational systems. Much of this awareness stems from the production of the first EUDISED report (1) prepared by a Working Party in 1969. In its conclusions that Working Party focused attention on the inadequacies of the existing educational documentation and information systems, noting in particular the inefficient handling of data and the massive duplication and waste that was inherent in a system relying on totally inadequate communication techniques. The Working Party therefore proposed the creation of a computer based European Documentation and Information System for Education (EUDISED) in the geographical region covered by the member States of the Council for Cultural Cooperation and set out a three phase programme for achieving this objective.

Central to this programme was the setting up of a Steering Group which promptly called for the preparation of some basic studies on fundamental features of the proposed system. These papers which were published in EUDISED Technical Studies 1971 (2), assisted the Steering Group to define the operational details of the preliminary phase of work. As a result the Steering Group invited the ad hoc Committee for Educational Documentation and Information to set up two working parties and to provide them with resources necessary for them to complete their task within two years. The report of the Steering Group was received at the annual meeting of the ad hoc Committee for Educational Documentation and Information, held in Strasbourg, 13-14 April 1972. At this meeting the recommendation to set up a Working Party on formats and standards was adopted, and Mr. R.E. Coward (UK) was nominated as Chairman. (At the same meeting the second Working Party was also set up to elaborate the Multilingual EUDISED Thesaurus. Mr. K. Spangenberg (Federal Republic of Germany) was nominated as Chairman, and Mr. J. Viet (France) as Rapporteur.)

Terms of reference of the Working Party

The Committee defined the terms of reference of the Working Party as follows:

> "To submit to the Committee, by the end of 1973, if possible, a draft agreement on formats and standards for the interchange of information on educational book and non-book materials and to take into consideration the technical studies by Mr. R.E. Coward and Mr. J.E. Linford".

Membership of the Working Party

The following six countries agreed to be represented by one expert each; Austria, France, Federal Republic of Germany, Spain, Sweden and the United Kingdom.

In addition, Mr. J.E. Linford (UK) and Mr. M. Chauveinc (France) were nominated. Observers from interested international organisations were invited. A full list of the attendances at each of the sessions of the Working Party is given in Appendix A.

Meetings of the Working Party

The Working Party met on four occasions between July 1972 and July 1973. Details are given in Appendix A.

Studies proposed by the Working Party

The following studies were commissioned by the Secretariat as a result of proposals made by the Working Party :

1. Draft EUDISED format; prepared by J.E. Linford and submitted to the Working Party at the meeting held in November 1972 in Paris.

2. Study on character sets and character representation for the EUDISED network; prepared by R. Bernhardt and submitted to the Working Party at the meeting held in April 1973, Luxembourg.

3. A final report together with additional material and an outline of a future programme of work; prepared by R.E. Coward and presented in draft form at the final meeting of the Working Party held in July 1973.

4+. Implementation format; to be prepared by M. Gorman.

5+. Media code study; to be prepared by M. Shifrin.

Methodology adopted by the Working Party

At its first meeting, in July 1972, the Working Party faced an acute dilemma. Across an extremely short period, during which it would meet for no more than eight working days, it was required by its terms of reference to submit

> "A draft agreement on formats and standards for the interchange of information on educational book and non-book materials ...."

Formats and standards for bibliographic interchange are currently the concern of teams of specialists in national libraries and information institutions who have already been working for several years to establish the complex requirements of machine and bibliographic systems as a basis for some kind of standardization between agencies involved in an exchange network. There is, unfortunately, no major educational documentation centre committed to this work which could have provided the Working Party with a starting point. The problem therefore appeared to be to relate the general systems work to an educational context. Closer examination of the practicalities of an educational network revealed that it would have two quite exceptional features :

(a) The field of education is of a dual nature; on the one hand there is a recognisable field of study in itself, a study of education, or pedagogy, while on the other hand there is the fact that education may be held to be concerned with all aspects of knowledge since it is involved with the theory of knowledge, the psychology of learning and the sociological aspects of knowledge in addition to the subjects of the curriculum. In principle, any subject may be taught and thus education reaches into all corners of the universe of knowledge as a particular kind of activity (3).

+ These studies were defined at the final meeting of the Working Party and subsequently commissioned by the Secretariat.

(b) The field of educational documentation is not limited or even centred round one media type. Records for books and non-book materials will be generated and exchanged within the network and undoubtedly some network centres will specialize in non-book areas. It would not therefore be appropriate to develop a system which was fundamentally book-oriented or periodical article oriented even if the system could be stretched to include other materials. In the long run a network standard which was neutral to media type or field of study, was required.

The dilemma facing the Working Party was that there was neither a general starting point available from which an educational subset could be developed nor was there a ready made set of minor but essential standards such as media codes, intellectual level codes, target audience codes, etc., which might have been developed by an international educational documentation institution. Under these circumstances no detailed draft agreement on formats and standards could possibly be prepared within the time scale or within a "Working Party" framework. It was decided therefore that the Working Party could best meet the basic objectives of the Steering Group and the EUDISED project by:

(a) identifying the levels of standardization which were necessary within the proposed network and relating the definition of these standards to various developmental stages of the network.

(b) Recommending ISO standards where they were available and indicating where ISO standards provided a foundation on which an extended EUDISED network standard could be based.

(c) Concentrating its attention on the central problem of defining, at a level of generality, a neutral implementation format. The feasibility of this had been examined at some length in the Linford report and the Working Party had in its terms of reference been specifically enjoined to take this into consideration in elaborating a draft agreement.

The recommendations towards a draft agreement on formats and standards forming the next section of this report of the Working Party fall a long way short of agreement at the detailed level which will be required in an operational network. The Working Party are of the opinion that while further levels of technical specification can be usefully studied in the next phase of development, the point has now been reached where the key institutions in the proposed network must become involved in the process of defining the standards required by the network. A clear distinction can be made between those standards which can be primarily regarded as more general than the network, i.e., format-interchange standards, cataloguing standards, basic character set codes, language codes, and those standards which are EUDISED centred, i.e., network institution codes, educational media codes, etc.

Schedule of Network Standards

Transmission Standards

(1) Record format
(2) Magnetic tape
(3) Tape labels
(4) Character representation

Bibliographic Standards

(1) Catalogue Code
(2) Filing Rules
(3) Classification systems
(4) Indexing Systems

Code Standards

(1) Media identification codes
(2) Language/country/institution codes
(3) Standard item numbers

Format Implementation Standards

(1) Full implementation
(2) Basic implementation
(3) Multi-level implementation
(4) Single level implementation

RECOMMENDATIONS TOWARDS A DRAFT AGREEMENT ON FORMATS AND STANDARDS

TRANSMISSION STANDARDS

1. Interchange Format

The Working Party recommend the acceptance of ISO 2709; Bibliographic Information Interchange - Format for Magnetic Tape Recording as the interchange format for the EUDISED network.

Notes

a. The essential features of the format are described in Appendix B.

b. While accepting the standard the Working Party took note of the fact that it did not as yet contain a satisfactory method of transmitting records which were larger than the maximum physical block size.

c. The Working Party took note of the fact that the 'sub-record' holding technique was inadequately described in the standard and was also unnecessarily cumbersome and complex for programming. The equivalent British standard omitted this feature. The preliminary draft of the UNISIST reference manual also refers to the unsatisfactory nature of the standard in this respect and alternative techniques are briefly considered.

2. Magnetic Tape Standards

The Working Party recommend that magnetic tapes corresponding to the appropriate ISO standards are written in either:

a. Nine track, odd parity, 800 CPI, or

b. Seven track, odd or even parity, 556 CPI

In addition the Working Party recommend that a 1600 CPI nine-track version should be accepted if both parties in an exchange wish to communicate at this packing density.

Notes

Three alternatives are unsatisfactory but the development of an efficient network might be hampered by an unnecessary insistence that the appropriate ISO standards must be available before the more advanced 1600 CPI systems are used.

3. Tape Labels

The Working Party recommend that all labels conform to ISO standards. In this area ISO 1001 is under revision and includes a block spanning technique.

Notes

There is no specific ISO standard for magnetic tape labels for bibliographic interchange files. The need for a standard is less than urgent and it would be preferable to establish this within the context of ISO and directly related to ISO 2709.

4. Character Representation

The Working Party recommend that the ISO standard (ISO/R 646; 7-bit code) is adopted as a standard by the EUDISED network and that the extended character set based on this code matrix (which will be an essential requirement of the network) should conform to ISO 2022.

Notes

a. The ISO 7-bit character set is given in Appendix C.

b. The Working Party took note of the rapid progress being made by ISO/TC 46/SC 4/WG 1: Character Sets for Documentation and Bibliographic Use.

c. The Working Party noted the need for network agreement on a method for 'spelling out' characters which individual institutions may not wish to include in their local character sub-set.

BIBLIOGRAPHIC STANDARDS

The Working Party did not address itself, except in general terms, to the question of bibliographic standards. It would in any case be unwise to attempt to carry out any detailed work in this area until direct involvement of network institutions is possible. The following notes are provided to assist the ad hoc Committee in the task of planning the next phase of network development.

1. Cataloguing Standards

Some preliminary work should be undertaken particularly in the field of cataloguing standards. A common cataloguing standard covering book and media material is fundamental to efficient exchange.

It is therefore recommended that for records of printed materials, the cataloguing principles adopted by the network conform to those laid down in the Paris Statement of Principles, 1961, and at the Copenhagen Meeting on Shared Cataloguing, 1969. In the twelve years since the Paris conference a large number of national codes have been formulated based on these principles.

Work is now in hand in various countries on the development of specific cataloguing codes for non-book media. These developments are at their most advanced in the United Kingdom where a draft revision of the Anglo-American Cataloguing Rules, Part 3, which deals with non-book media, has been prepared by the Library Association Media Cataloguing Rules Committee. This will be published within a few months. The basic approach is expressed in the following "General principles" statement:

> "In the non-book materials for which these rules are intended the creative responsibility for intellectual or artistic content is characteristically shared among several persons and bodies performing between them a variety of functions, the relative importance of which to the work is difficult to determine, and which often possess no analogy with the authorship of books and texts. These materials are therefore regarded as constituting an exception to the General Principles determining the entry of books and book-like materials in catalogues, as set out in the Introductory Notes of Chapter 1 of the Anglo-American Cataloguing Rules, with their emphasis on the determination of primary responsibility for the work, that is, of author. Although this need is also felt in some classes of audio-visual materials (for example, recorded music), in general the emphasis is, first, on the establishment systematically for each item of a body of descriptive information which satisfies the needs of the user in any of the several approaches he may make to the material catalogued; second, on the anticipation - from the relationship of the various names and titles associated with the item in description - of the most effective points of access to this information, as headings in the catalogue file.

"The objective of the cataloguer is taken primarily to be the establishment of a standard catalogue entry which is the first entry to be made and the basis of all other entries. The standard catalogue entry consists of a standard item description together, in certain prescribed circumstances, with a primary names heading. Additional entries are made as required by adding second headings to the standard catalogue entry".

It is suggested that these rules, drawn up in harmony with the Paris Principles will provide a suitable starting point for a study of the non-book cataloguing procedures to be adopted by the network.

2. Filing Rules

The specification of a general set of filing rules for use in the EUDISED network is desirable. The general problem of filing impinges on network standards at a fundamental level. Machine filing cannot be done satisfactorily unless there are adequate filing signals built into the record. This means that filing requirements must be considered as part of the process of defining the level of field and subfield identification in a EUDISED record.

There are other minor problems. Most filing codes have special and usually conflicting rules about the treatment of initials, acronyms, abbreviations, etc. Some of these are handled by input conventions, others require more elaborate 'double entry' techniques.

ISO has recently initiated a programme within TC 46 for the specification of an international bibliographic filing standard. A preliminary meeting was held at The Hague in October 1972. At this meeting it was agreed that a statement of filing principles together with an outline programme of work leading to the preparation of a standard should be prepared. Extracts from this document are presented in Appendix D.

It is recommended that future work on the specification of filing rules for use in the EUDISED network be based on the 'filing principles' statement (if accepted by the ISO Working Party) and linked to the ISO programme of work.

3. Classification and indexing systems

This area is the responsibility of the Working Party on the Multilingual EUDISED Thesaurus.

CODE STANDARDS

By 'code standards' is meant that information in the record which is held in coded form. The following is a complete list of the code requirements identified by the Working Party.

1. Record status code

   Defined in draft format.

2. Media type code

   A preliminary study on media type code is being prepared.

3. Bibliographic level codes

   Defined in draft format

4. Source of record code

   To be defined by network

5. Language codes

It is recommended that the Library of Congress code be adopted pending the preparation of an ISO standard.

6. Publication codes

To be defined by network.

7. Intellectual level/Target group codes

To be defined by network.

8. Geographic area code

This code indicates the main geographic area which is the subject of the document. It is recommended that the Library of Congress code be adopted pending the preparation of an ISO standard.

9. Country of publication code

It is recommended that the appropriate ISO standard (ISO/DIS 3166 : Codes for representation of names of countries) be adopted. As the proposed format provides for two-digit representation, this would be the ISO Alpha 2 Country Code.

10. Standard item numbering

Although standard item numbering was excluded from the Working Party's terms of reference, the significance to the EUDISED network of international standardization work in this area was particularly noted.

FORMAT IMPLEMENTATION STANDARDS

Following the acceptance of ISO 2709 as a machine format the Working Party was able to devote most of its first three sessions to a detailed consideration of an implementation format for the EUDISED network. At its first meeting it agreed that 'a single format built up from a more basic analysis of the data elements in a wide variety of records was a practical possibility'. Consequently the Working Party adopted the following recommendation :

> "Having considered the problems of 'format proliferation' the Working Party recommend that a study be commissioned to examine the possibility of a unified approach to format definition".

J.E. Linford was commissioned to produce a preliminary draft for the second meeting of the Working Party.

The first draft of the proposed format was presented at the second meeting of the Working Party in November 1972. It was recognised that the new 'omni-media' approach which the Working Party had felt to be essential in the context of a EUDISED network had been satisfactorily achieved at the considerable level of detail which had been written into the draft which also covered recommendation number 5 of the first meeting.

> "Arising out of the work completed under the previous recommendation the Working Party recommend that a supplementary study be undertaken to define an 'omni-media' tagging system."

After point by point discussions and proposals for detailed amendment, the draft was 'accepted in principle'. It was however proposed by Mr. Linford and endorsed by the Working Party that having regard for the importance of securing the maximum possible involvement by world experts, the draft should be amended and circulated for individual comment. Mr. Linford agreed to receive comments and take them into consideration when preparing the definitive draft of the format which he undertook to have ready by the beginning of 1973.

The final version of the draft format+ was presented at the third meeting of the Working Party in April 1973. Mr. Linford reported that all criticism which seemed valid had been incorporated into the draft. It was noted that there was overwhelming agreement among the experts consulted with the statement of format philosophy.

The proposed draft has three special characteristics:

a. A primary 'type of field' analysis.

b. A structural analysis into levels (where required) within which a full range of tags and subfields can be used.

c. Options for a simplified version of the standard in respect of the use of levels and subfield code definition which nevertheless offer a high degree of data element identification.

These characteristics are analysed in more detail in Appendix E. The Working Party agreed to ask that a special study should be commissioned to investigate further the options at (c).

Following further extensive discussions the Working Party were satisfied that the draft was now in a sufficiently developed form to serve as a basis for a EUDISED contribution to the on-going ISO/IFLA standardization programme. The following resolution was adopted at the third meeting of the Working Party:

'... having regard to the general principle that the EUDISED network should adopt international standards as they exist or come into existence for bibliographic exchange purposes, the Working Party recommended that arrangements be made to ensure that the proposals put forward in the Character Set Study++ by R. Bernhardt and the Format Study by J.E. Linford be considered in the context of the on-going ISO/IFLA standardization programmes and that a report on progress in this area be prepared for the ad hoc Committee for Educational Documentation and Information.'

+ It was noted by the Working Party that the 'final draft' of the format was only the final draft of the study as commissioned. The format itself was open to further modification and further definition. International discussions following the third meeting of the Working Party had resulted in some adjustments to subfield coding to provide more room for future expansion, and in the addition of a special media dependent supplementary information tag. These, together with other improvements would be incorporated in the first 'operational' draft of the format when this stage was reached.

++ At its fourth meeting the Working Party recommended the adoption of ISO 2022.

PART 2: ASPECTS OF NETWORK DEVELOPMENT

Introduction

The deliberations of the Working Party centred around three major topics - the machine format, the implementation format and the EUDISED character set. These are all practical problems which must be related to a practical rather than a hypothetical network. The machine standard cannot satisfactorily be defined without some knowledge of the logical structure of the records carried; the implementation format cannot be defined without detailed knowledge of the content of records and the reason for transmission, and the character set cannot be defined without knowledge of the source of records and the output services that will be generated.

In this section of the report the operational features of the EUDISED network, when it exists, are examined so that the recommendations in Part 1 of this report can be better considered in a real context.

Network development

The system envisaged is a fluid structure within which the three 'levels' of agencies noted below would be represented, operating under the guidance of a central agency with overall responsibility for network development.

The functions of the central agency are envisaged as including:

a. A network co-ordination secretariat

b. A small central systems and software team to liaise with new institutions wishing to join the network, and with institutions up-grading their network involvement

c. Network standards control and development. This is essential; if the network is to function efficiently its standards must be observed.

The 'levels' envisaged are:

Level 1

An assemblage or nodal group of key agencies with special responsibilities within the network. These agencies will, because of their pre-eminence in their country, or in a special educational field or activity, assume duties such as the intake and conversion of material from other networks, the maintenance of databases, the production of special services, the preparation of records, etc.

Level 2

The main network of institutions receiving machine-readable services from the Level 1 group of agencies. Each Level 1 agency will probably have a group of institutions as a subnetwork although such arrangements should be fluid and informal rather than rigid. Overlapping subnetworks based on national boundaries and special subject interests are to be expected.

Level 3

The educational community at large. This Level is world-wide and will include any library or information system that purchases and uses the information/indexing/abstracting services generated by the network.

Operations within Level 1

a. Extracting data from external tape based services.

This operation requires vastly more than computer time and programming expertise. Adequate conversion specifications can only be prepared with a detailed knowledge of the input and conventions behind the specification of tape based services. Moreover all tape based services are subject to slight but constant change that is neither explicitly stated nor documented.

Unless the EUDISED network develops a major international centre, it would be advisable to nominate different institutions for the responsibility of linking with services such as MARC, ERIC, etc.

b. Maintenance of databases

The EUDISED database will be large and will grow rapidly. It will contain vast quantities of externally produced material and increasing quantities of records for audio-visual and teaching aids material largely generated by network institutions. How the material will be held cannot be predicted. Each country in a EUDISED network will develop its own national policy for national information networks and it seems probable that in some countries major database systems providing storage for several networks - education, scientific, bibliographic, etc., might be established. The next phase of the EUDISED project should include a study of database systems, e.g., ESRO, INIS, etc. In particular the relevance of the CAN/SDI type of system (National Science Library of Canada) to EUDISED should be investigated.

c. Production of special services

1. Primary information services

A primary information service is a 'computer to computer' service. In off-line systems these are tape based and may consist of the total transfer of records from a central agency to other institutions or selective tape services based on institutional 'profiles'.

On-line primary services can be expected to develop fairly quickly. In the long run these will be developed efficiently only if a standard database interrogation system is developed and the user does not have to learn different query routines to interrogate different databases. This aspect of EUDISED development must be related to national information network policy.

2. Secondary information services

A secondary information service is generated from the database and issued in printed or microfilm form. Secondary services range from published abstracting and indexing services to personal 'current awareness' services.

3. Processing services

In all probability the major intake for the network will be handled by the central agencies although preparation of input data sheets, etc., will be a widely distributed local operation. Particular attention to quality control monitoring is essential. Basic control is best obtained by the careful design of mandatory input sheets.

Back up services

The primary reason for developing a EUDISED network is to communicate information relating to education. It has been accepted that, within the present state of the art, such a network must be largely restricted to holding information about information, that is records identifying and describing documents and other materials. This communication system must therefore be directly linked to efficient storage and distribution systems. The National Lending Library in the United Kingdom is an excellent example of this type of back-up service. This aspect of EUDISED development must be related to national library policy.

Systems Development

The development of bibliographic networks has been, almost without exception, unplanned, unsystematic and extremely inefficient. This is because

1. data input and simple exchange systems are set up before serious attention is paid to standardization.
2. exchange systems are designed before local handling systems.
3. local systems are developed independently and in near isolation.

Some of these errors may have been inevitable in such a new area of development. The EUDISED network can, however, be regarded as a second generation system. It offers a unique opportunity to integrate the various systems elements to achieve balance and efficiency. This approach, though it may delay the first experimental exchange in the network, will enormously speed its development.

Standardization

The basic EUDISED standardization effort has been organised well in advance by the Steering Group and partly carried out by the Working Parties.

Exchange systems and local handling systems

This is essentially a question of defining the relationship between exchange formats and local handling formats in the network. It is now considered that the differences between an exchange format and a basic handling format are superficial only. It is therefore possible to define a local format 'standard' and to write software that will operate on both local and exchange records

Generalised local system software

The development of basic software in the EUDISED network will depend primarily on developing a local record standard. There have been attempts to build generalised systems operating on any structures that can be defined but these are unsuitable for the practical operations of a EUDISED network. With a local standard it is possible to write

1. An exchange to local conversion module for handling all records received through the network. This program will provide for
   a. Selection of records by 'profile' or number
   b. Selection of designated fields from records
   c. Character set conversion
   d. Conversion downwards to a basic level implementation
2. A local input and file handling module.

   These programs would offer a standard input system, standard record correction, file update and merge routines.
3. A generalised output module. These programs would provide options for
   a. Creating locally defined sets of entries from a master record on file
   b. Sort key construction from locally defined strings of data elements
   c. Device independent print options - line printer, computer output microfilm, computer typesetting

These basic modules should all be prepared as part of a pre-network software development programme. Beyond this point there is ample scope for co-ordinated software at a higher level. In particular specification and programming for database interrogation should be a carefully co-ordinated exercise.

Conclusion

The advantages of controlled network development are overwhelming. Nevertheless the realities of existing systems which may be extended to contain EUDISED must be recognised. In the preliminary planning phase attention has been concentrated on standards. Further progress in this area should involve the institutions that will form the network. It should therefore largely be concentrated in the next planning phase when the network takes shape.

In the second planning phase close attention should also be given to the design of a standard basic local record format and the specification of generalised programs to operate on that format. These problems have been briefly referred to in this section of the report. It is suggested that a preliminary study of software aspects of existing bibliographic networks be commissioned to provide background information for the design study.

REFERENCES

1. Council of Europe, EUDISED Vol. 1. Report of the Working Party, Strasbourg, 1969
2. Council of Europe. EUDISED Technical Studies, 1971. Strasbourg, 1971.
3. Foskett, D.J. A study of the role of categories in a thesaurus for educational documentation. Council of Europe, 1973.
4. Coward, R.E. "Towards an international filing standard : some notes on a prepared methodology" (To be published in International Cataloguing 1973).

Reference is also made to the following ISO standards :

ISO/DIS 646	7-bit coded character set for information processing interchange (Revision of ISO/R 646 - 1967)
ISO/R 1001	Magnetic tape labelling and file structure for information interchange
ISO 2022	Code extension techniques for use with the ISO 7-bit coded character set
ISO 2709	Bibliographic information interchange - format for magnetic tape recording
ISO/DIS 3166	Codes for the representation of names of countries.

REPORT OF THE WORKING PARTY

APPENDIX A: SCHEDULE OF MEETINGS AND MEMBERSHIP OF THE WORKING PARTY

Meetings held

1. Strasbourg, 11-12 July 1972
2. Paris, 16-17 November 1972
3. Luxembourg, 26-27 April 1973
4. Strasbourg, 19 July 1973

Participants

The numbers given in parenthesis after the participants' names indicate the meeting or meetings attended.

NATIONAL REPRESENTATIVES

Austria

Staatsbibliothekar abs. jur. Gerhard SILVESTRI (1, 2, 3, 4)
Bundesministerium für Unterricht und Kunst
Minoritenplatz 5
1010 WIEN

France

Mr Claude BONNEFOI (1, 2, 3, 4)
Professeur chargé d'études
Responsable du Groupe d'informatique documentaire de l'INRDP
29 rue d'Ulm
PARIS 75005

Mr. Marc CHAUVEINC (2, 3)
Conservateur
Bibliothèque Interuniversitaire de Grenoble
BP 22
38 SAINT-MARTIN-D'HERES

Mr. Roland KOCH (1)
Groupe d'informatique documentaire de l'INRDP
29 rue d'Ulm
PARIS 75005

Federal Republic of Germany

Mr. Norbert BERGHOF (1, 2)
Institut für Bildungsplanung und Studieninformation
Königstrasse 32
7 STUTTGART

Mr. Rüdiger BERNHARDT (1, 2, 3, 4)
Zentralstelle für maschinelle Dokumentation
Herriotstrasse 5
6 FRANKFURT - NIEDERAAD

Spain

Mr. Fernando PEREZ de SEVILLA y AMORES (3)
Jefe de Estudios del Centro de Procesos de Datos
Ministerio de Educacion y Ciencia
Vitruvio 4
MADRID 6

Mrs. Maria Pilar TORRES BAAMONDE (1, 2)
Directora del Proyecto de Documentacion Automatizada
CENIDE
C-Universitaria
Ministerio Educacion y Ciencia
MADRID

Sweden

Mr. Gunnar BERNANG (1, 2, 3, 4)
Consultant
National Board of Education
106 42 STOCKHOLM

United Kingdom

Mr. Richard COWARD (Chairman of the Working Party) (1, 2, 3, 4)
The British Library
Central Administration, Systems Development Branch
Africa House
Kingsway
LONDON WC2B 6DB

Mr. John LINFORD (1, 2, 3, 4)
The British Library
Central Administration, Systems Development Branch
Africa House
Kingsway
LONDON WC2B 6DB

OBSERVERS

Unesco

Mr. W. LÖHNER (4)
Division of Scientific and Technological Information and Documentation
Unesco
Place Fontenoy
PARIS 75700

Mr. Vladimir RYBATCHENKOV (2)
Division of Scientific and Technological Information and Documentation
Unesco
Place Fontenoy
PARIS 75700

Commission of the European Communities

Mr. Marcel DETANT (1, 2, 3)
Centre d'Information et de Documentation
Commission des Communautés Européennes
Aldringerstrasse 29
LUXEMBOURG

Mr. Michel COLIN (3)
Centre d'Information et de Documentation
Commission des Communautés Européennes
Aldringerstrasse 29
LUXEMBOURG

Mr. Jean HARDT (3)
Centre d'Information et de Documentation
Commission des Communautés Européenes
Aldringerstrasse 29
LUXEMBOURG

International Organization for Standardization

Mr. Michel BOISSET (3)
Bureau pour l'automatisation des bibliothèques
4 rue Louvois
75084 PARIS CEDEX 02

Mrs. Anne-Marie MOTAIS de NARBONNE (2)
Bureau pour l'automatisation des bibliothèques
4 rue Louvois
75084 PARIS CEDEX 02

Mr. Gunnar SUNDBLAD (4)
Sveriges Standardiseringskommission
Box 3 295
103 66 STOCKHOLM

LIBER (Ligue des Bibliothèques Européennes de Recherche)

Mr. Kenneth HUMPHREYS (4)
University Library
E. BIRMINGHAM 15

CONSULTANT

Mr. William SCHIEBER (3)
International Labour Office
1211 GENEVA 22

COUNCIL OF EUROPE

Ad hoc Committee for Educational Documentation and Information

Mr. Jean VIET (Chairman of the Committee) (2)
Directeur, Service d'échanges des informations scientifiques
Maison des Sciences de l'Homme
54 Boulevard Raspail
PARIS 6e

Secretariat General

Mr. Bernhard von MUTIUS (1, 2, 4)
Head of the Division for Educational Documentation and Research
Council of Europe
STRASBOURG

Mr. John DAVIES (Secretary of the Working Party) (1, 2, 3, 4)
Division for Educational Documentation and Research
Council of Europe
STRASBOURG

Miss Claude PARVE (1, 4)
Documentation Centre for Education in Europe
Council of Europe
STRASBOURG

WRITTEN OBSERVATIONS

The Council of Europe acknowledges the assistance provided to the Working Party by the wide circle of experts and institutes who responded to the invitation to submit written observations on the preliminary drafts of Mr. Linford's format and Mr. Bernhardt's study on character sets. It would extend this Appendix unnecessarily to name all of them here; the following list is confined to those whose comments on the preliminary draft format were summarised in a document that was tabled for examination at the third meeting of the Working Party.

Bibliotekscentralen, Ballerup, Denmark
(Mr. E. Balling)

Bibliothèque Interuniversitaire de Grenoble
(Mr. M. Chauveinc)

Centre Nationale de Documentation Scientifique et Technique, Brussels
(Mr. R. Gabriel and Mrs. P. Scherer)

College Bibliocentre, Ontario
(Mr. G. Wright, in consultation with Mr. E. Buchinski, Canadian National Library)

Library of Congress, MARC Development Office, Washington
(Mrs. H. Avram)

National Board of Education, Stockholm
(Mr. G. Bernang)

Royal Institute of Technology Library, Stockholm
(Mr. B. Tell)

Royal Library, Copenhagen
(Mr. M. Weiteyer)

Royal Ministry of Education, International Secretariat, Stockholm
(for Swedish Institutions)

Universitäts Bibliothek, Bochum
(Prof. Dr. Pflug)

University of Technology, Loughborough
(Mr. R. Wall)

INTERNATIONAL STANDARD ISO 2709

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•ORGANISATION INTERNATIONALE DE NORMALISATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

This document forms part of Council Book 3/73

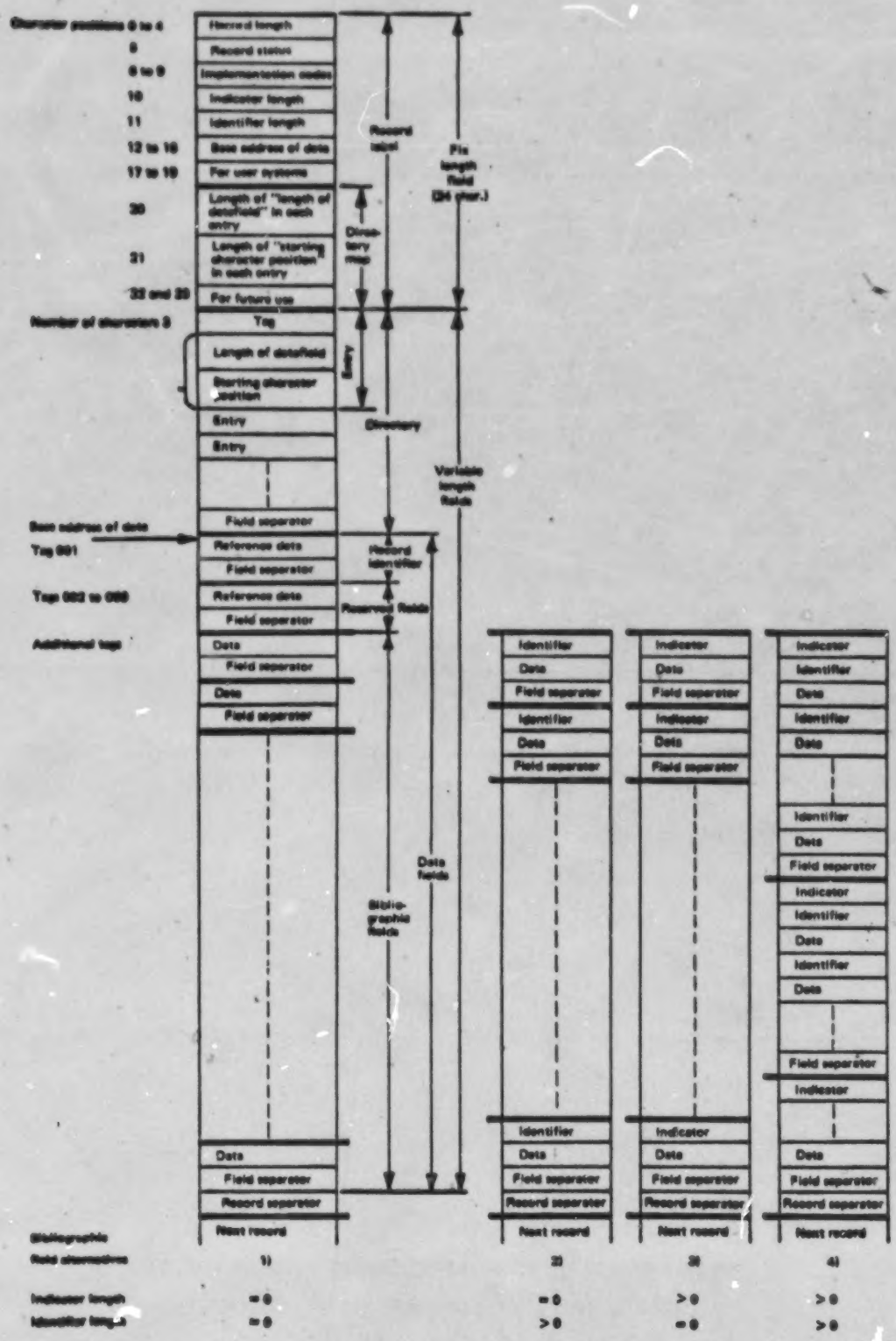
Voting terminates on 1973-05-17

Documentation — Formats for bibliographic information interchange on magnetic tape

UDC 681.85 : 025.4

MAY NOT BE REFERRED TO AS INTERNATIONAL STANDARD UNTIL ACCEPTED BY ISO COUNCIL

Detailed structure of the interchange format



Essential features of the interchange format

The draft international standard ISO 2709 : Bibliographic Interchange Format for Magnetic Tape is designed to place no constraints on the content or organisation of records transmitted. It is therefore particularly suitable as a basis for standardisation in a network which will contain a wide variety of institutions exchanging a wide variety of records about many different media.

The standard refers to machine structure only. It is not concerned with the content of the records. In particular it does not refer to any specific features such as the use of classification systems, descriptor systems or cataloguing codes. It has the capacity to hold as many alternative systems as are required by the network.

A record in the communications structure contains 3 basic sections

Record Label	Record directory	Control & data fields

Record Label

The record label is a field occurring at the beginning of each bibliographic record providing parameters for the processing of the record, i.e., record length, record status, media codes, etc.

Record Directory

The record directory consists of a series of fixed length entries (12 characters each) which contain the identification tag, the length and the Starting Character Position of each of the variable fields in the record.

Tag	Length	Starting Character Position

Control & Data Fields

These are variable length fields containing bibliographic elements such as author, title, publisher, etc. Each data field may be further divided into subfields.

APPENDIX C : BASIC EUDISED CHARACTER SET - EXTRACTS FROM ISO/DIS 646

7-BIT CODED CHARACTER SET FOR INFORMATION PROCESSING INTERCHANGE

(Revision of ISO/R 646-1967)

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard contains a set of 128 characters (control characters and graphic characters such as letters, numerals and symbols) with their coded representation. Most of these characters are mandatory and unchangeable, but provision is made for some flexibility to accommodate special national and other requirements.

1.2 The need for graphics and controls in data processing and in data transmission has been taken into account in determining this character set.

1.3 This International Standard consists of a general table with a number of options, notes, a legend and explanatory notes. It also contains a specific international reference version, guidance on the exercise of the options to define specific national versions and application oriented versions.

1.4 This character set is primarily intended for the interchange of information among data processing systems and associated equipment.

1.5 This character set is applicable to all latin alphabets.

1.6 This character set includes facilities for extension where its 128 characters are insufficient for particular applications.

1.7 The definitions of some control characters in this International Standard assume that data associated with them is to be processed serially in a forward direction. Their effect when included in strings of data which are processed other than serially in a forward direction or included in data formatted for fixed record processing may have undesirable effects or may require additional special treatment to ensure that the control characters have their desired effect.

2 IMPLEMENTATION

2.1 This character set should be regarded as a basic alphabet in an abstract sense. Its practical use requires definitions of its implementation in various media. For example, this could include punched tapes, punched cards, magnetic tapes and transmission channels, thus permitting interchange of data to take place either indirectly by means of an intermediate recording in a physical medium, or by local electrical connection of various units (such as input and output devices and computers) or by means of data transmission equipment.

2.2 The implementation of this coded character set in physical media and for transmission, taking into account the need for error checking, is the subject of other ISO publications.

ISO/DIS 646 - Basic code table

Bits b_7	b_6	b_5	Column →	0	0	0	0	1	1	1	1
				0	0	1	1	0	0	1	1
				0	1	0	1	0	1	0	1
b_4	b_3	b_2	b_1	0	1	2	3	4	5	6	7
0	0	0	0	NUL	TC_7 (DLE)	SP	0	⑩	P	` ⑧	p
0	0	0	1	TC_1 (SOH)	DC_1	!	1	A	Q	a	q
0	0	1	0	TC_2 (STX)	DC_2	" ⑨	2	B	R	b	r
0	0	1	1	TC_3 (ETX)	DC_3	② £ (#)	3	C	S	c	s
0	1	0	0	TC_4 (EOT)	DC_4	③ $ (¤)	4	D	T	d	t
0	1	0	1	TC_5 (ENQ)	TC_8 (NAK)	%	5	E	U	e	u
0	1	1	0	TC_6 (ACK)	TC_9 (SYN)	&	6	F	V	f	v
0	1	1	1	BEL	TC_{10} (ETB)	' ⑪	7	G	W	g	w
1	0	0	0	FE_0 (BS)	CAN	(	8	H	X	h	x
1	0	0	1	FE_1 (HT)	EM	)	9	I	Y	i	y
1	0	1	0	FE_2 (LF) ⑫	SUB	*	:	J	Z	j	z
1	0	1	1	FE_3 (VT) ⑬	ESC	+	;	K	④	k	⑫
1	1	0	0	FE_4 (FF) ⑭	IS_4 (FS)	, ⑤	<	L	⑥	l	⑭
1	1	0	1	FE_5 (CR) ⑮	IS_3 (GS)	—	=	M	⑦	m	⑮
1	1	1	0	SO	IS_2 (RS)	.	>	N	⑧ ⑨	n	— ⑩ ⑪
1	1	1	1	SI	IS_1 (US)	/	?	O	_	o	DEL

REPORT OF THE WORKING PARTY

APPENDIX D: EUDISED FILING PRINCIPLES AND PRACTICE

In the section of the report covering a Draft Agreement on Formats and Standards, reference is made to the need for a general set of filing rules for the EUDISED network and it is suggested that future work in this area be linked to an ISO programme which has been only recently initiated. A preliminary document has been prepared for ISO but not yet officially circulated. For the information of the Working Party and the ad hoc Committee the sections of particular concern to EUDISED follow.

Annex B: Filing principles

GENERAL PRINCIPLE

Catalogues are constructed to satisfy a variety of needs. An agreed filing practice must therefore be regarded primarily as a solution to the problem of offering the most useful collection to the most users.

CITATION ORDER PRINCIPLE

The citation order of elements in a printed entry (excluding non-filing elements) should correspond to the sequence of data elements in the sort key.

FILING CRITERIA PRINCIPLE

Whenever possible filing criteria should be made explicit by adding elements to an entry specifically for the purpose of positioning it in a file in the required position relative to other records.

CONSISTANCY PRINCIPLE

The basic character set sequence adopted for the file should be applied consistently. If exceptions are necessary references should be inserted at the point of entry determined by the correct application of the basic character set sequence.

'FILE AS IS' PRINCIPLE

When primary data (that is, data taken from the title-page area) is used as a filing element, the written form as presented should, as a general rule, be used in the construction of the sort key. Spoken 'normalised' forms should be entered as references if necesary.

Annex C: Filing signals required in machine readable records

1. The most urgent need for work on bibliographic filing concerns the rapid proliferation of machine records. Millions of records have already been prepared and will be used in library catalogues and national bibliographic services the world over. Within a few years most of these catalogues will be machine generated and therefore machine sorted. It is important that it should be possible to achieve satisfactory sequences without human intervention.

2. To achieve this it is proposed that a standard for filing signals in machine readable records should be prepared. This is a vital stage in the preparation of an international filing standard since it will

   (a) identify those elements which have filing significance

   (b) provide guidelines for the standardisation work on content designators (under consideration by an IFLA working group and ISO TC46/SC4/WG4).

3. The standard will only be concerned with identifying where filing information is needed and what filing information is needed. It is the task of the above-mentioned group to consider the more general problems of content designation in machine records.

4. The standard will not be concerned with specifying how a filing signal will be used. That is the final objective - the preparation of an international filing standard.

5. There are enormous practical advantages in carrying through this exercise since it will identify, at the very least, a common area of essential filing information required by the majority of countries. This information could have a considerable effect on international MARC agreements.

Annex D : Structure of an international filing standard

(for catalogues primarily consisting of entries in the roman alphabet)

DRAFT OUTLINE

SECTION 1 : Character set sequence

Rules specifying the relative order of the character set, including characters with no filing order. Specific rules will cover

(a) Order and treatment of symbols and numerics

(b) Diacritical marks, accents

(c) Punctuation marks

(d) Non-roman alphabet characters

(e) Subscripts, superscripts, etc.

SECTION 2 : Composite headings

An analysis of heading structures and rules covering the relative filing weight of the elements in composite headings.

SECTION 3 : Entry types

An analysis of entry types and rules concerning the relative filing weight of each type.

SECTION 4 : Special filing conditions

REPORT OF THE WORKING PARTY

APPENDIX E: ESSENTIAL FEATURES OF THE DRAFT EUDISED FORMAT

General functions of the format

(Reprinted from the Draft EUDISED Format prepared by J. Linford)

1. To allow for any element of information, or sub-element of information, of significance in document handling to be identified precisely.

2. To include mechanisms which allow:

   i. the retrieval from a data bank of records by any one or some defined record characteristics;

   ii. the processing of the record in any physical form of output (e.g. catalogue cards, printed or microfilm listings); in any type of listing by any factor of arrangement (e.g. full author catalogue, full subject catalogue, brief title listings, name title indexes, subject index);

   iii. the filing of records in a sophisticated manner.

   On a more conceptual level format functions can be summarised as providing the ability to

   SELECT (and by converse REJECT)

   MANIPULATE

   and DISPLAY

   on any of the defined record characteristics or data elements, in order, among other objectives, to permit EFFECTIVE INTERCHANGE.

Format Philosophy

The exercise of creating the EUDISED format has led to a search for some basic principles which would guide and constrain the way in which the format should be developed.

The EUDISED format should:

1. Provide a structure which will contain any type of formalised document record or assembly of information presented as a title bearing statement with names associated and with an appended description.

2. Define fields in analytical terms of content without, in the first instance, implying a bibliographic function.

3. Carry as much significant definition as possible in the 3-digit tag in order to give as direct access to data as remains consonant with limiting excessive directory growth.

4. Limit the use of indicators to supplying information which generates a manipulative action based on varying conditions within a field. No indicator should in any way affect the definition of a particular field.

5. Limit subfield definition to an agreed level based upon a consensus of

   a. Whether the subfield data has a retrieval value

   b. Whether the defined sub-element may or may not be required in an output listing

   c. Whether the defined sub-element has unique filing or typographical representation.

6. Provide a dual potential for

   a. Handling data elements to form discrete listings and assemblages of data elements present (= catalogue and bibliographic listing function)

   b. Direct retrieval by information codes held in defined information code fields of the record (= information retrieval function).

7. Provide an analysis of elements which does not presuppose any preferred arrangement at output.

8. Seek to optimise a modular approach to format development so that

   a. where subfield codes are stated for a condition which recurs within a range of analogous tags, only one statement of subfield codes will be made

   b. a single table of indicators is provided which can be used as relevant throughout the record.

   This approach will provide a degree of certainty to those responsible for coding input and will simplify the format presentation by the avoidance of the necessity to restate what are essentially common elements.

9. Seek to provide the optimum balance between direct access to information, reasonable size of directory, and processing penalties associated with character by character search.

10. Provide a logical distinction between

    reserved data fields which will be used for a second level access to directory type information

    bibliographic data fields which will carry explicit bibliographic information.

11. Provide, if possible, alternative 'implementation levels' in the use of the format which will nevertheless afford a high degree of data element identification with minimal use of special conventions (particularly in the use of subfield codes). This attempt will be based on formalisation of punctuation and could be presented at a later date as the basis for an agreement on levels of information.

12. Provide field and subfield definition for any universally required level of definition agreed within the network. Variant requirements could nevertheless be met by creating output listings utilising data held in information codes and explicit data fields.

13. Provide a high degree of convertibility to other existing machine formats.

Coding structure of the EUDISED format

Machine records must be coded so that each field is completely described both by type and by function. In practice there is little to choose between the different systems in use. For the EUDISED network it was considered that the traditional functional analysis of a MARC record was unsuitable because of the primary emphasis it places on the library catalogue functions - i.e. main entry, added entry. The UNISIST coding structure on the other hand cannot be applied within the single generalised format philosophy developed for EUDISED. The draft EUDISED structure is neutral, but hospitable to both. This is an essential characteristic of a format for a network which will make use of a great deal of material transferred from other networks. The following table shows the main coding structure of the draft format.

EUDISED FORMAT: TABLE OF MAIN FIELDS

001 Record Control No.

008 Information codes
Language/Date/Publication/Intellectual level/Country, etc.

02X Numbering of documents
ISBN, ISSN, etc.

1XX Names
Names of persons and bodies associated with the document, film, recording, etc.

2XX Titles
Title and title information borne by the document, (etc.) or relating to the document.

301 Edition

31X Publication data
Publisher, Manufacturer, Sponsor, Distributor, etc.

351 Physical description

4XX Notes

5XX Classifications

6XX Verbal subject data
Subject headings, keywords, descriptors, etc.

Alternative coding structures

The draft EUDISED format has been designed to provide for the most complex interchange, information retrieval and printing requirements. Experience elsewhere suggests that the central agencies of operational networks need this degree of refinement and easily develop a capacity for the level of analysis required. However, it is considered that an alternative basic standard is also necessary, particularly during the early stages of network development. It is also frequently impractical to edit large files for conversion to a precisely analysed format. A valid alternative format should however provide a high degree of data identification. It is therefore suggested that a system of coding at the field level could be accompanied by formalised layout and punctuation as a basis for a second level standard.

The International Standard Bibliographic Description has been specifically designed to provide a format statement of a bibliographic record in which the separate elements can be recognised both by man and machine. This technique has so far only been applied to bibliographic records and only to the body of the entry. The same technique can readily be extended to other media records and the same principle of standard punctuation can be applied to Name Fields outside the body of the entry.

The details of a second level basic implementation standard based on ISBD punctuation should be worked out in a second round of standardisation when the primary system has been fully defined. Sample inputs of the kind required at both levels of analysis are given in Appendix F.

Level structures

The need to provide for records constructed at several levels is recognised in the ISO Standard and in UNISIST and MARC implementations of that standard. The mechanism proposed is however somewhat clumsy and with the exception of the UK MARC and INIS systems has not been implemented. The draft EUDISED format contains the following statement which was endorsed by the Working Party

> 'The consensus of opinion emerging from comments on the preliminary draft EUDISED format holds that whereas (the sub-record) provision allows full control of sub-record occurrence, it is unnecessarily cumbersome and complex for programming and should be reconsidered by the appropriate ISO committee. A directory structure holding level, tag, length, and starting character position would provide better access and control'.

However, even assuming that better mechanisms can be devised and accepted, the need to handle multiple levels in a generalised system such as EUDISED does significantly effect the complexity of the system. An alternative single level structure should be considered.

A single level version of the EUDISED format can be extracted from the draft statement without difficulty. The draft format identifies the seven bibliographic levels as follows -

1. Collection
2. Sub-collection
3. Document
4. Volume
5. Analytical
6. Sub-volume
7. Volume Analytical

In a single level implementation the first step in creating a bibliographic description is to decide which 'level' is most applicable to the document in hand. A journal article is analytic. A book is catalogued at the monograph level but a chapter in a book is catalogued at the analytic level. A bibliographic record for a serial is catalogued at the collection level. In a single level treatment the statements which essentially refer to other levels are carried in a note form. In a traditional catalogue entry the series notes and the contents notes are examples of 'other level' statements. The EUDISED format has been written to permit this alternative treatment although the specific mechanisms have not been worked out in the draft. Examples of multi and single level treatment of records are given in Appendix F.

APPENDIX F: EXAMPLES

This Appendix contains examples of different types of input and report forms. In some cases the coding details are those used in existing operational systems and do not therefore correspond to the EUDISED proposals.

Example No. 1	This is an example of a report form for a multi-media record system. It shows a single level coding system with full subfield analysis.
Example No. 2	A line printer output of a media record for proof reading purposes.
Examples No. 3, 4 and 5	Samples of a printed catalogue prepared from a media data bank. These demonstrate how a master record in a data bank can be manipulated to produce many different forms of output.
Example No. 6	A media record containing three levels (collection, subcollection, document), with multi-level coding and full subfield analysis. In this example, as in the next, the tags and subfields are written in to demonstrate alternative EUDISED structures. This is not compatible with demonstrating appropriate input techniques which would, by using default mechanisms and other techniques, drastically cut down the amount of 'field coding' input required.
Example No. 7	A media record containing three levels (collection, subcollection, document), with single level treatment and formalised layout replacing full subfield coding.

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Report form: for HELPIS 3 Catalogue — Example 1

Do not mark this column	CONSULT GUIDANCE NOTES WHEN COMPLETING FORM	For use in institution
248010	Item title $a Arches feedback	
44000	Series title	
280000 $e	Place of reporting institution: Edinburgh.	
$b	Name of reporting institution: Heriot - Watt Univ.	
$c	Commissioning department and date of production: 1969	
$d	Holding department: Mr. J. Cowan, Dept. of Civil Engineering.	
500000	Summary of contents (not more than 100 words): Questions and answers from the 'Arches' programme. Uses the method of choosing from four alternatives.	
	Author(s):	
	Other participants:	
500/1	For whom intended: 1st year civil engineering students.	
503000	Supplementary materials: Note on use : Feedback unit or multiple choice sheets necessary. Restrictions on use:	

Running time 30 mins — TECHNICAL DETAILS OF MASTER COPY

008000	FILM	BW ☐ Col ☐	35 mm ☐ 16 mm ☐ Std 8 ☐☐ loop Super 8 ☐☐ loop	Sound: Com opt ☐ Com mag ☐ Sep mag ☐	Silent: 16 fps ☐ 18 fps ☐ 24 fps ☐ 25 fps ☐	If loop, cassette type:		
$b $c	TV	BW ☐ Col ☐	High band ☐ Low band ☐	Tape width: 1 inch; Machine make and type: Ampex 7003				
$c $d	SLIDES OR FILM-STRIPS	BW ☐ Col ☐	Number of frames: with sound ☐	(If with sound, complete SOUND TAPE section)				
$d $d	SOUND TAPE	Tracks: 2 ☐ 4 ☐	Reel ☐ Cassette ☐ Stereo ☐	Speed: ips; If synchronised to slides, system: ; If cassette, type:				
$e	OTHER MATERIALS	Description and details						

360000 TV	300000	$b 1" : Ampex 7003 $c 30 mins.

Return form to: NCET, 160 Gt Portland Street, London, W1N 5TB

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001 0 00 / 0  $ab7100225¤
008 0 00 / 0  014 710303 $as1971     $ben       $c     $dc     $e0 $f0 $g0 $h0 $i0 $jb $k  $leng $m
015 0 00 / 0  $aB7100225¤
082 0 00 / 0  $a624.1775¤
083 0 00 / 0  $aStructural elements. Arches¤
245 0 10 / 0  $aArches feedback¤
260 0 00 / 0  $aEdinburgh$bHeriot-Watt Univ.$c1969$dMr J. Cowan, Dept. of Civil Engineering¤
300 0 00 / 0  $b1": Ampex 7003$c30mins¤
350 0 00 / 0  $aTV¤
500 0 00 / 0  $aSummary:Questions and answers from the 'Arches' programme. Uses the method of choosing
              from four alternatives¤
500 0 00 / 1  $aFor whom intended:1st year civil engineering students¤
503 0 00 / 0  $aNote on use: Feedback unit or multiple choice sheets necessary¤
690 0 00 / 0  $z101$astructural components$z101$aarches¤
692 0 00 / 0  $a001207083•
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Example 2

Immigrants in our schools. – York: St John's Coll. of Ed., Education Dept. (Television Service). – B & W. Low band. 1": Ampex 7803; 80 mins.
Summary: Four programmes. – 20 mins each: 1.The requirements of the teaching situation. 2.The problem of communication. 3.Abilities and aptitudes. 4.Social and cultural background. The aim of these programmes is to provide selected content for a general course on immigrants for students who have little or no opportunity to observe actual situations. The situations and topics covered are intended as a spring board for discussion and subsequent study. Authors: A. Jones and R. Gilderdale.
TV

(B72-00087)

Introducing SCOPE, Stage 1. – Leeds: Leeds Univ., Institute of Education. 1971 (Schools Council Project). – col. 32 frames/2 tracks. /sd (not synchronised). 3 3/4ips; 18 mins.
Summary: SCOPE, Stage 1, is an introductory English course for English speaking immigrant children aged 8-13. There is an accompanying leaflet provided. The material is held by Schools Council Project, who are considering the possibilities of marketing this for colleges of education, teachers' centres. Authors: J. Derrick and J. Kennedy. – Supplementary materials: Accompanying leaflet. Copyright held by Schools Council Project (Information centre for further information: 160 Great Portland St., London W1N 6LL). – Local item number: 18/9411.
SS/S

(B72-00088)

Learning to speak English in Glasgow. – Glasgow: Jordanhill Coll. of Ed., Applied Linguistics Dept. 1971 (Audio-Visual Media Dept). – B & W. Low band. 1": Ampex 7003; 28 mins.
Summary: An observation videotape recorded at the Immigrants' Language Reception Centre in Glasgow. This centre caters for immigrant children whose knowledge of English is insufficient to enable them to cope in normal classrooms. The tape shows a teacher dealing with a group ranging widely in age (approx. 9-14 years), cultural backgrounds and linguistic ability. She uses a blend of class teaching, group activity and individual work and the tape illustrates her role as organiser and manager of a complex learning situation. Author: L. Dickinson. – Intended use: Specialist teachers of immigrant children. – Local item number: 50/71A.
TV

(B72-00089)

SCOPE in action. – Nottingham: Nottingham Coll. of Ed., Schools Council Project in English for Immigrants, c/o Leeds University. (The College/SCOPE, Leeds University). – B & W. Low band. 1": Ampex 7003; 1/2": Sony; 20 mins.
Summary: The use of SCOPE material for the teaching of immigrant children in a Leicester primary school. (1" Ampex Copy at SCOPE, Leeds University; 1/2" Sony Copy at Nottingham College of Education). Presenter: Mrs Dulin Hemmings. – Intended use: For trainee and in-service teachers. Supplementary materials: SCOPE publications.
TV

(B72-00090)

Teaching English to the multi-racial class. – York: St John's Coll. of Ed., Primary Education Dept. 1971 (Television Service). – B & W. Low band. 1": Ampex 7803; 45 mins.
Summary: The aim of this programme is to demonstrate the use of specially designed teaching techniques which challenge a multi-racial class at various levels of language ability. School: Pear Tree Junior, Derby. Class teacher Mr Norman Pickett. Children 9-10. Materials: Unit 1 of 'Teaching English to West Indian children: A suggested language scheme'. Author: J.A. Jones. – Intended use: Analysis of approach and technique in course of teaching English to Immigrants. College of Education.
TV

(B72-00091)

Teaching of English to immigrants. – Chorley: Chorley Coll. of Ed., CCTV Unit. 1971 (CCTV Unit). – B & W. Low band. 2"; 1": Ampex 7003; 30 mins.
Summary: This shows how the schools in Huddersfield use SCOPE in order to teach English to immigrants. The teachers are shown using this method (extracts of their teaching) and the Director, Mr Burgin, briefly outlines some of the problems and difficulties his unit have to deal with in Huddersfield. The tape also includes excerpts of the way in which Asian immigrants are taught English at an infant school. – Intended use: For college of education students, immigrant centres. Supplementary materials: Notes available.
TV

(B72-00092)

372.1 – ELEMENTARY SCHOOLS
372.11 – Teaching and teaching personnel
Reception for what I am going to do. – York: St John's Coll. of Ed., 1970 (Television Service). – B & W. Low band. 1": Ampex 7803; 20 mins., 30 mins.
Summary: Movement at Wheldon Lane Primary School, Castleford (now closed). Children 8-11. Class teacher Miss Bessie Bullough. Part 1. Miss Bullough talks about her work and we see children's paintings and later extracts from their written work. Part 2. Continuous recording of a movement lesson taken by Miss Bullough. It exemplifies the restraint of the good teacher and the absolute involvement of children when they understand what is required of them. Author: G. Cramer. – Intended use: 2nd or 3rd year college of education students - Inspirational.
TV

(B72-00093)

372.1102 – Teacher-student relation
Say what you mean. – York: St John's Coll. of Ed., Education Dept. 1969 (Television Service). – B & W. Low band. 1": Ampex 7803; 35 mins.
Summary: Observations in the bayonet of Mrs Pyrah's success. In her classroom she says 'We are all learning here'. The teacher and the children share their thoughts - consistently controlling their utterances. The children (third year primary) are seen on a visit to the Farne Islands and then in their classroom to see how they develop notions gained out of school. A provocative videotape about an unusual teacher in a West Riding primary school. An interview with Mrs Pyrah is used as the basis for the programme construction. Author: G. Cramer.
TV

(B72-00094)

372.125 – Grouping of pupils for instruction
Middle school. – York: St John's Coll. of Ed., 1970 (Television Service). – B & W. Low band. 1": Ampex 7803; 30 mins.
Summary: The videotape material was made in one day so that there is real feeling for the flexibility of purpose for which this middle school at Grimethorpe in the West Riding of Yorkshire was designed. An introductory statement is provided by the headmaster, Tom Gannon. The sliding walls open up to form a complex of spaces for a range of group activities including first year music, art and writing. Second year children are engaged on oral French; third years are occupied with environmental studies; and fourth year, art and science. Author: G. Cramer.
TV

(B72-00095)

372.133 – Audio-visual materials for teaching
Aspects of infants' education. (4 parts). – London: ILEA Television Service, [n.d.] (Administrative Office). – B & W. High band. 2": Ampex; approx. 20 mins. each.
Summary: The series is intended for infant teachers as part of their in-service training. There are four programmes in the series, two on co-operative teaching and two on some uses of audio-visual aids in infant schools. Extensive use has been made of video-tape recordings which demonstrate every point made by the presenter. The co-operative teaching programmes were made at an infant school in Brixton; the audio-visual aids programmes at a school in North Kensington - both schools with a very high proportion of immigrants and situated in a low income area. The programmes do not aim to show teachers how to adopt certain techniques but rather to show them what can be done and the benefits that can be derived from co-operative teaching and the use of certain audio-visual aids. – Supplementary materials: Teachers' notes. Restrictions on use: Negotiable loan.
TV
Also classified at 372.341

(B72-00096)

372.2 – LEVELS OF ELEMENTARY EDUCATION
372.21 – Preschool education
Playgroup. – Bath: Bath Univ., Bath Playgroups and Pre-school Training Assoc. 1969 (Educational Services Unit). – B & W. Low band. 1": Ampex 7003/9003; 40 mins.
Summary: To show the working of a playgroup with commentary explaining the purposes of the activities. Author: Sarah Williams. – Intended use: Demonstration of playgroup activities to students or parents.
TV

(B72-00097)

372.216 – Nursery schools
Nursery education. – Cheltenham: St Mary's Coll. of Ed., Audio-Visual Aids Unit. 1971 (Audio-Visual Aids Unit). – col. sd. S. st; 25 mins.
Summary: Embodies present education principles. A day in the work of a nursery school. (Pair's Junior/Infant School). Authors: A. Cambridge and S. Allen.
F

(B72-00098)

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Atomic physics See Nuclear physics
Atoms
  Chemical structure 541.24
  Physical structure & properties 539.14
Audio aids. Teaching
  Beds ST473 & Philips BL3388 battery powered cassette
    recorders 371.3333
Audio-visual aids. Professional education. Medical
    personnel 610.7
Audio-visual aids. Teaching 371.33
  – Conference proceedings 371.33
  – Study examples: French language instruction 371.33
  Closed circuit television 371.3398
  Synchronised slide projectors & tape recorders 371.33
  Television 371.3398
Audio-visual aids. Teaching. Primary schools 372.133
Audio-visual aids. Universities
  Television – Study examples: Stoke Poor University
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Audio-visual aids departments. Colleges
  Organization – Study examples: Loughborough College
    of Education 371.33
Auditory perception. Children, 5-12 years
  Musical scales 153.15
Authorship
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Autistic children 155.454
Automatic balances. Weight measuring instruments 542.3
Automatic computers See Computers
Automatic control systems
  See also
    Servomechanisms
Autonomic nervous system. Medicine
  Effects of drugs – Experimental animals: Cats 615.78

Baccalaureate
  Celtic. Class development 369.3
Bachelorhood 306.348
Balances
  Monitor Top pan balances 542.3
Balances. Weight measuring instruments
  Automatic balances 542.3
Bales Category Analysis. Social interactions. Small groups
    301.11
Ball games
  See also
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Ballet
  Olgin, John & Dalle, Annie. Interviews 792.82
  Petra Conkel – Lead ensembles: Paris 792.7
Basketball 796.323
Battery powered cassette recorders. Audio aids. Teaching
  Beds ST473 & Philips BL3388 battery powered cassette
    recorders 371.3333
Beams. Structural components 624.1773
Beatings. Precision instruments
  Fluid flow bearings 621.822
  Oil-ring bearings 621.822
Beckett, Samuel. Drama in English
  Come and Go & Ih Joe. Performances 792.9
Beckman Model E analytical ultracentrifuges. Applications
    in biological research 574.192
Beds. Influence on social change. Great Britain 942.04
Behaviour
  See also
    Aggression
    Psychology
    Sex relations
    Skills
    Verbal behaviour
Behavioural sciences
  See also
    Social sciences
Behavioural sciences. Environment 301.3
Behnke's Handbuch der ergebnisse Chemie. Library
    sources. Organic chemistry 547
Bell & Howell Filmosound 16mm projectors. Visual aids.
    Teaching 371.33533
Bending-moment diagrams
  Shapes related to framed structures. Shapes 624.171
Berlin
  1945-1963 940.55
Biochemistry
  – Lectures 574.192
Biological research
  Applications of Beckman Model E analytical
    ultracentrifuges 574.192
Biology
  See also
    Botany
    Living systems
    Microbiology
    Zoology
Biology
  Electron microscopy 578.18
  SF 600 spectrophotometers 574.191
  Teaching methods. Martin & Timmins approach
    574.07711
Blackpoles
  See also
    Biochemistry
Blind control
  See also
    Communication
Blended-helium alloys
  X-ray diffraction patterns 669.956583
Blending agents. Neuromuscular junction. Medicine
  Pharmacological properties 615.78
Blending drugs. Effects on circulating membranes. Spec.
    Medicine
  Adrenergic neurone & ganglion blocking drugs –
    Experimental animals: Cats 615.78
Blood pressure. Medicine
  Effect of dopaminomimetic drugs – Experimental animals:
    Cats 615.78
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Board games. Psychological tests
  Applications of computer systems 153.7
Boating
  See also
    Canoeing
Boats
  See also
    Ships
Bookbinding 655.7
Books
  See also
    Bookbindings
Botany
  See also
    Plants
Boundary layer. Fluids
Boundary layer. Gases
Brass bands
  Musical instruments 788.0871
Bristol University See University of Bristol

INPUT WITH FULL MULTI-LEVEL & SUBFIELD CODING

MEDIA RESOURCES CENTRE CATALOGUING PRO FORMA FOR MATERIA

Subject:	3	611	00	$j Metric System
Special refs:				
Location: Classification:	3	501	00	$h 372.72
Author	3	111	00	$h Other $i A.N. $1 (b.1894)
TITLE	3	261	00	$h Go metric
WITH PARALLEL TITLE				
AND SUBTITLE				$o an explanation of the metric world
AUTHOR/CREATOR				$r by A.N. Other
AND ANY OTHER				$t with drawings by Sid Leech
RESPONSIBILITIES				
EDITION	3	301	00	$h 4th ed. $i revised by Percy Speed
IMPRINT: Place	3	311	00	$h London
Publisher				$j Herne Hill Press
Place & distributor				$j Metrication Branch
Address (if required)				
Year				$k 1975
Collation	3	351	00	$j 128p. $k ill. $j 22 cm.
SERIES	1	261	00	$h Herne educational series $u Vol. 28
SUBSERIES	2	261	00	$h Metrication today $u No. 18
& Publisher's Cat. No.				
Additional classifications:				

Class'd:
Cat:
Coll'd:
Typed:
Completed:

Example 7

INPUT WITH SINGLE LEVEL CODING & FORMALISED PUNCTUATION

MEDIA RESOURCES CENTRE CATALOGUING PRO FORMA FOR MATERIA

Subject:		611	Metric system
Special refs:			
Location:	Classification:	501	372.72
Author			
TITLE WITH PARALLEL TITLE AND SUBTITLE AUTHOR/CREATOR AND ANY OTHER RESPONSIBILITIES		261	Go metric: an exploration of the metric world/ by A.N. Other; with drawings by Sid Leech.
EDITION		-	4th edu/revised by Percy Speed
IMPRINT: Place Publisher Place & distributor Address (if required) Year		-	London: Herne Hill Press: Metrication Branch, 1975.
Collation		-	128p: illus (some col.), 23 cm.
SERIES SUBSERIES & Publisher's Cat. No.		-	(Herne educational series; Vol. 28) (Metrication today: introductory booklets; No. 18).
Additional classifications:			

Class'd:
Cat:
Coll'd:
Typed:
Completed:

DRAFT EUDISED FORMAT

by

JOHN LINFORD

The British Library

London

April 1978

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DRAFT EUDISED FORMAT

PART 1: ANALYSIS OF EXISTING FORMAT SITUATION

The original MARC format (LC MARC I) shows to a marked degree its historical development from rules and practices developed for the handling of book materials in a traditional library cataloguing environment+. The sequence of the main data fields represents that of a traditional catalogue entry

i.e. Author
Title
Edition
Imprint
Collation
Series
Notes
Subject heading information
Added entries
References

The definition of fields shows in areas the breakdown into categories of types reflecting certain distinctions made in cataloguing rules

e.g. author fields are broken down into

Personal
- forename type
- surname/forename
- compound surname
- family name

Corporate
- inverted
- government
- direct order
- conference

This structure has been reflected in other later formats which have stemmed from the pioneering work of the Library of Congress. These formats include

BNB/MARC II

MONOCLE

CANADIAN MARC

LIBRIS

Other formats which have developed on rather different bases are :

COSATI

ERIC

ICSU/AB

INIS

+ See LC MARC II format (p. 23-27) for a discussion of "Traditional versus analytical organization ..." in format construction.

The Library of Congress has itself developed a number of formats for different types of works, e.g., maps, serials, films, sound recordings. These share the commonality of the MARC structural base. However, following this approach fields which could be generalised are allocated in a specific way. For example LC have found it necessary to provide fields for standard book numbers, standard serial numbers, and standard film numbers. If one takes the generalised approach, it is thought necessary only to provide one field for standard numbers, since the distinction between types of document is established by the media codes held in the leader. This difference in approach is significant in tackling the problems of compiling a multi-media database with the aim that it should be processable by unified software.

Limitations of existing formats

The analysis given below seeks to identify areas of difficulty in existing formats. This identification is intended to help in resolving these problems. Some problems are more intractable than others.

1. Confusion between tag function and indicator function: in LC MARC and derived formats authorship conditions are stated by a combination of tag and indicator position, e.g., personal author, surname/forename type is identified by TAG 100 - Personal author INDICATOR 1 = 1 surname/forename type.

   This condition of personal authorship could easily have been stated as TAG 101, leaving both indicators free for other functions.

2. Failure to make adequate provision for the precise handling of document records in areas other than the traditional 'main' and 'added entry' situations, e.g., without recourse to ancillary techniques added entries cannot be made under the authors and titles of volumes of multi-volume works, editors of series etc., while at the same time maintaining the correct relationship between all elements occurring within a single record.

3. Inability to provide a total filing potential where a record contains elements of information which have a different filing value than the value of the characters present as data in the record, e.g.

The Boys Brigade	TO FILE AS	Boys Brigade
Mc	TO FILE AS	Mac
St.	TO FILE AS	Saint

   The history of the XVII Royal Hussars TO FILE AS The history of the 000017th Royal Hussars

   (This is not true of MONOCLE where a total filing technique is given).

4. Limitation to single types of material (e.g. books) or to the printed media (e.g. books, reports, serial contributions, etc.). No existing format makes provision for total coverage of documents of every type (e.g. film, TV, books, maps, sound recordings, etc.).

5. Failure to adopt a modular approach to format construction whereby the analysis and formulation of a particular condition is used wherever that condition occurs. Although a modular approach is partly exemplified in the mnemonic conditions of the DXX tags, which are reused in analogous situations in 4XX, 6XX, 7XX, 8XX and 9XX in the MARC format, and there is reuse in some instances of subfield codes within these tags, it has not been carried out thoroughly.

6. Failure to provide a sufficiently precise analysis and definition at the field level in certain areas (e.g. in note fields, where only a few conditions are catered for).

7. An insufficiently precise formulation of the purpose and handling of information retrieval data in 'information code' fields and some as separately defined data fields.

PART 2: EUDISED FORMAT: STATEMENT OF FORMAT FUNCTIONS AND PHILOSOPHY

Functions of a Format

1. To allow for any element of information, or sub-element of information, of significance in document handling to be identified precisely.

2. To include mechanisms which allow:

   i. the retrieval from a data bank of records by any one or some defined record characteristics;

   ii. the processing of the record in any physical form of output (e.g., catalogue cards, printed or microfilm listings); in any type of listing by any factor of arrangement (e.g., full author catalogue, full subject catalogue, brief title listings, name title indexes, subject index);

   iii. the filing of records in a sophisticated manner.

   On a more conceptual level format functions can be summarised as providing the ability to

   SELECT (and by converse REJECT)

   MANIPULATE

   and DISPLAY

   on any of the defined record characteristics or data elements, in order, among other objectives, to permit EFFECTIVE INTERCHANGE.

Format Philosophy

The exercise of creating the EUDISED format has led to a search for some basic principles which would guide and constrain the way in which the format should be developed.

The EUDISED format should:

1. Provide a structure which will contain any type of formalised document record or assembly of information presented as a title bearing statement with names associated and with an appended description.

2. Define fields in analytical terms of content without, in the first instance, implying a bibliographic function.

3. Carry as much significant definition as possible in the 3-digit tag in order to give as direct access to data as remains consonant with limiting excessive directory growth.

4. Limit the use of indicators to supplying information which generates a manipulative action based on varying conditions within a field. No indicator should in any way affect the definition of a particular field.

5. Limit subfield definition to an agreed level based upon a consensus of

   a. Whether the subfield data has a retrieval value

   b. Whether the defined sub-element may or may not be required in an output listing

   c. Whether the defined sub-element has unique filing or typographical representation.

6. Provide a dual potential for

   a. Handling data elements to form discrete listings and assemblages of data elements present (= catalogue and bibliographic listing function)

   b. Direct retrieval by information codes held in defined information code fields of the record (= information retrieval function).

7. Provide an analysis of elements which does not presuppose any preferred arrangement at output.

8. Seek to optimise a modular approach to format development so that

   a. where subfield codes are stated for a condition which recurs within a range of analogous tags, only one statement of subfield codes will be made

   b. a single table of indicators is provided which can be used as relevant throughout the record.

   This approach will provide a degree of certainty to those responsible for coding input and will simplify the format presentation by the avoidance of the necessity to restate what are essentially common elements.

9. Seek to provide the optimum balance between direct access to information, reasonable size of directory, and processing penalties associated with character by character search.

10. Provide a logical distinction between

    reserved data fields which will be used for a second level access to directory type information

    bibliographic data fields which will carry explicit bibliographic information.

11. Provide, if possible, alternative 'implementation levels' in the use of the format which will nevertheless afford a high degree of data element identification with minimal use of special conventions (particularly in the use of subfield codes). This attempt will be based on formalisation of punctuation and could be presented at a later date as the basis for an agreement on levels of information.

12. Provide field and subfield definition for any universally required level of definition agreed within the network. Variant requirements could nevertheless be met by creating output listings utilising data held in information codes and explicit data fields.

13. Provide a high degree of convertibility to other existing machine formats.

PART 3: EUDISED FORMAT

3.1 PROPOSED INTERPRETATION OF ISO 2709 - FORMAT FOR BIBLIOGRAPHIC INFORMATION INTERCHANGE ON MAGNETIC TAPE

This standard identifies those format conditions which must be met following the Working Party's decision to accept the ISO standard for interchange.

Those which affect the EUDISED format analysis study are set out below. A bibliographic record includes the items defined in Section 4 and contains the following fixed and variable fields in the sequence shown in Figure 2 (references in this section are to document ISO 2709).

- a record label	fixed field
- a directory	variable field
- record identifier	variable fields
- reserved fields (max 8)	variable fields
- bibliographic fields	variable fields
- field separators (fs)	
- a record separator (rs)	

The field separator (fs) shall be character IS_2 of the ISO/R 646 (7-bit code). The record separator (rs) shall be character IS_3 of the ISO/R 646 (7-bit code).

The record label includes provision for the following codes:

Record status (character position 5). A single character.

Implementation codes (character positions 6 to 9) to describe record type (e.g. a book, journal, an article*) and bibliographic level (analytical, single document, collection, etc.).

Character position 10. Indicator length. A single character identifying the number of indicators used in the format implementation.

Character position 11. Identifier length. A single character indicating the number of characters used as an identifier in the format implementation.

Two areas in the record label are not allocated precisely
i.e., Characters 17-19 (for user systems)
Characters 22-23 (for future use).

A TAG is defined as 3 characters associated with a field and used to identify that field (cf 4.12). By implication (cf. 5.3) the tag consists of numeric characters.

An INDICATOR is defined as '... supplying further information about the contents of the field, about the relationship between the field and other fields in the record, or about the action required in certain data manipulation processes' (cf 4.4).

---

* The ISO standard has failed to distinguish between the two related concepts of type of document in record (e.g. book, film, journal) and the levels present in the record (e.g. collection, document, analytical). This can be seen by the standard's citing of "article" as a record type when in fact it is a combination of type of document (journal) and level (analytical) see page 53.

Data fields

There are three types of data fields :

- record identifier data fields : tag 001;
- reserved data fields : tags 002 to 009 as required;
- bibliographic data field : tags 010 to 999 as required.

NOTE THAT DATA FIELDS 001 AND 002-009 DO NOT CONTAIN INDICATOR(S) OR IDENTIFIER(S) (cf 5.3.1[1] and 5.3.2[1])

ISO 2709 also requires that "When, for bibliographic reasons, it is necessary to divide a bibliographic record into subrecords, tag 002 shall be used for a subrecord directory constructed in the same way as the directory and referring to the directory." + (cf 5.3.2)

The EUDISED interpretation of the record label follows. Other requirements of the ISO standard are dealt with in the appropriate sections of the EUDISED format.

Record Label

CHARACTER POSITION 5. RECORD STATUS

n = new

c = corrected

d = deleted

i = incomplete record

CHARACTER POSITIONS 6-9. IMPLEMENTATION CODES

CHARACTER POSITIONS 6-8. MEDIA TYPE CODE

A 3 character code identifying media type (see Appendix 1 and Appendix 1A for examples of specimen codes showing the degree of specificity which can be achieved at this 3 character level).

CHARACTER POSITION 9. LEVEL CODE

A single code defining the level or levels present in the record.

The codes will be :

1 = collection

2 = collection plus document

3 = collection plus document plus analytical

++ 4 = collection plus analytical

5 = document

6 = document plus analytical

++ 7 = analytical

These codes will be generated by the presence of level codes at input.

+ The consensus of opinion emerging from comments on the preliminary draft EUDISED format (and shared by the author) holds that whereas this provision allows full control of subrecord occurrence, it is unnecessarily cumbersome and complex for programming and should be reconsidered by the appropriate ISO Committee. A directory structure holding level, tag, length and starting character position would provide better access and control

++ Codes 4 and 7 are included since they are conceivable though not probable

CHARACTER POSITION 10. INDICATOR LENGTH

This will be set to 2.

CHARACTER POSITION 11. IDENTIFIER LENGTH

This will be set to 2.

CHARACTER POSITION 17. ENCODING LEVEL

A single code indicating the degree of completeness of the machine record in terms of

a. its data content, and/or b) its tagging and coding.
Codes(to be defined) will indicate, in the EUDISED context, for example :

- Full level using all TAG and subfield code provision
- Tag level only, with agreed formalisation of punctuation at subfields.

CHARACTER POSITIONS 18-19. SOURCE OF RECORD CODE

A 2 character code identifying the organisation creating the records.

A unique code will be assigned to each organisation contributing records to the network.

CHARACTER POSITION 23. NON-STANDARD DATA CODE

A single code indicating that the record contains data in field(s) which does not conform to network standards, or may require editorial change. This code will be generated by the presence of the non-standard indicator at input.

3.2 LEVELS

The concept of levels is fundamental to the modular approach adopted by the EUDISED format.

Within any one of the levels listed below it is possible to utilise the full range of tag, subfield, and indicator provision of the format, and thus provide total control of data. For example, entry of series data is first defined by the presence of the digit for 'collection' level, after which the tags for title, secondary intellectual responsibility, volume enumeration, etc., of the series will be used. Indicators can then be used to define non-standard conditions, special filing characteristics, etc.

Within fields, subfield definitions (e.g., of elements of name) is at the same degree of sophistication at all other levels as for main document level fields.

The levels recognised are

1. Collection
2. Sub-collection
3. Document
4. Volume (i.e., physical part of document)
5. Analytical (i.e., not physically separable part of document)
6. Sub-volume (physically separable part of physically separable part)
7. Volume analytical (not physically separable part of physically separable part)

At input these levels will be shown by the appropriate number preceding the tag, which will be followed by further digits signalling level repeat. Where only one group of fields is present at one level the level number is followed by a zero (0)

e.g. 30 - 261 = Title of document

40 - 261 = Title of volume or part

40 - 291 = Numbering of volume or part

10 - 261 = Title of collection

If the record contains more than one group of fields at the same level (e.g., more than one series, more than one analytical level) the number showing the level is followed by numbers indicating which sub-record the field belongs to

e.g. 10 - 261 = Title of series

11 - 261 = Title of second series

40 - 261 = Title of volume

41 - 261 = Title of second volume

The second level number serves to hold together all related data field elements, e.g., author, title and volume enumeration of a second series.

3.3 FORMAT DATA FIELDS

FIELD

A field is a discrete major element of the record, which itself may be divided into sub-elements (subfields).

Each field is defined by a 3-digit numeric TAG, and in addition will carry as the first data element associated with each datafield two indicators which will be set to zero when no other value is ascribed.

ISO 2709 divides fields into

- record identifier data field : tag 001
- reserved datafields : tags 002 to 009 as required;
- bibliographic datafield : tags 010 to 999 as required.

(NB. Record identifier fields and reserved datafields do not contain indicator(s) or identifier(s)).

A field separator (character IS_2 of the ISO/R 646 (7-bit code)) will be inserted at the end of each field.

A record separator (character IS_3 of the ISO/R 646 (7-bit code)) will be inserted after the field separator of the last field of the record.

The fields in the EUDISED format are listed, in TAG order, below

(NB. In the examples subfield boundaries are shown by the sign / ; actual subfields are shown in section 3.6).

Examples chosen to represent different media types are identified by the following codes:

A = Audio material B = Book F = Film S = Serials X = Other materials

001 The record control number+

Ideally the record control number should be the INTERNATIONAL STANDARD NUMBER relating to the type of document being catalogued (ISBN, ISSN, etc.). If the system using the format does not recognise ISNs, or if the medium has not got a standard numbering scheme, or if the document being catalogued has no standard number, any other appropriate number is used.

The number used as record control number will also be repeated in the appropriate field 021-026.

002 Sub-record directory data field

This field contains one or more directory entries relating to the presence of sub-record directories contained in and occurring at the end of the record directory. Data in this field is generated by the presence of information in the field enumerator used at input. Each sub-record directory groups and identifies all of the fields relating to a particular sub-record.

003 Non-standard field directory

This field contains one or more directory entries pointing to any field or fields in the record where the data content does not conform to the network standard appropriate to that field. Each directory will contain the TAG, LENGTH and STARTING CHARACTER POSITION of the field it identifies. Data in this field will be generated by the presence of information in the field enumerator used at input.

004 Amended record directory field

This field will contain one or more entries identifying any field or fields in the record which have currently been corrected. Data in this field will be generated by the master file correction message at input. Each entry will contain a character identifying the status of the amendment, and, further, will identify the level/tag/repeat of the corrected field. The status of the amendment will be indicated by the following codes:

A = amendment C = correction D = deletion

The data block is repeated as required in any single statement of correction.

008 INFORMATION CODES

The information code field will be fixed in length. The length will be 32 characters, plus the number of characters determined for the record finger-print.

In order to limit the length of this fixed field only primary information characteristics are encoded here. An associated information field (Tag 010) will carry secondary information characteristics and will use a combination of subfield codes, interior letter codes, and data to define these.

+ Problems will arise unless conventions are established within the network to ensure that numbers used as control numbers are adequately distinguished.

The information codes are :

LANGUAGE CODE

Main language = 3 characters

The 3 character ISO code will be used+

DATE OF PUBLICATION CODE

Date of publication = 9 characters

The date of publication code is introduced by either :

a = single date or span date

b = date of publication of first issue, part, etc. = open date

e.g. a1947 = published in 1947

a19471953 = published between 1947 and 1953

b1961 = commenced publication in 1961

PUBLICATION CODES

Form of arrangement = 2 characters

(e.g. Dictionary, encyclopaedia, manual, programmed text)

Genre = 2 characters

(e.g. Fiction, history, biography)

Other types of publication = 2 characters

(e.g. Government publications, intergovernmental publications, conference proceedings)

Publication status = 1 character

(e.g. Reprint, reissue, facsimile, draft)

The publication codes will be defined at a later date.

INTELLECTUAL LEVEL CODE OR TARGET GROUP CODE

= 2 characters

The code will record whether the publication is, for example, for children, for adolescents, for undergraduates. The codes will be defined at a later date, and will carry a complete statement of target groups for publications.

GEOGRAPHIC AREA CODE

= 7 characters

These codes are those used at the Library of Congress. The code will indicate the main geographic area which is the subject of the document.

COUNTRY OF PUBLICATION CODE

= 2 characters

+ The Working Party recommends the adoption of the Library of Congress code pending the preparation of an ISO standard.

PERIODICITY CODES

FREQUENCY

= 1 character

The single letter code records the frequency of serial publications. The codes will be defined at a later date.

REGULARITY

= 1 character

The single code 'X' will be used to indicate a serial publication with an irregular publication pattern.

RECORD FINGER-PRINT

= number of characters to be determined.

A 15-character identifier is outlined in MONOCLE (2nd ed. p.52-59) but may be subject to further refinement in view of ongoing research.

010 SUPPLEMENTARY INFORMATION CODES

This field carries secondary information characteristics of the same nature as that of the fixed field information codes (Tag 008). Information is identified by subfield codes. These are listed in the section 'SUBFIELD CODES' under the subheading 'subfields for supplementary information codes'.

02X NUMBERING OF DOCUMENTS

These fields contain the various numbers which a document may bear as part of international, national or local numbering systems. They may also contain an indication of the format of the document associated with the number, and the price of that document. One of these numbers, preferably the international standard number, is used as the record control number, but is also given in the appropriate 02X field.

Each field contains provision for the inclusion of alternative numberings.

021 INTERNATIONAL STANDARD NUMBER

For example :

B	021	/ 0 85331 304 0/ 0 85331 327 X
	021	/ 0 19 812136 9/ £3.25

022 NATIONAL NUMBER

For example :

B	022	/ 67-63613

023 PROVENANCE NUMBER

This field contains the number(s) assigned to a publication by the publishing or manufacturing agency.

For example :

A	023	/ AXTL 1099

024 LOCAL SYSTEM NUMBER

025 OTHER NUMBERS

086 RELATED DOCUMENT CONTROL NUMBERS

This field contains the 'linking' control number of preceding, succeeding or co-existent documents. For example one would record here the International Standard Serial Number of a serial which was continued by the serial being catalogued.

027 SHELF MARK

This field contains any non-subject based shelf mark (for call marks which are an extension of the classification number, provision is made at subfield level within the subject fields 8XX).

1XX NAMES

This group of fields contains the names of persons or bodies connected with the document.

The second character of the TAG will indicate the type of name (person, corporate body, family name).

The third character of the tag will indicate the relationship of the name to the record.

Thus:

11X	Name of person	1X1	Primary intellectual responsibility
12X	Name of family	1X2	Secondary intellectual responsibility
13X	Name of corporate body	1X3	Other intellectual responsibility
		1X4	Subject
		1X5	Associative
		1X6	References

1X1 PRIMARY INTELLECTUAL RESPONSIBILITY

These tags identify the names of persons or bodies assigned primary intellectual responsibility by the relevant standard.

For example:

B Hamlet by William Shakespeare
111 /Shakespeare/William

A Abbey Road: The Beatles
131 /The Beatles

1X2 SECONDARY INTELLECTUAL RESPONSIBILITY

These tags identify the names of persons or bodies with a secondary intellectual responsibility recognised by the relevant standard.

For example:

B Hamlet by William Shakespeare edited by G Wilson Knight
112 /Knight/G Wilson

F Accident a film directed by Joseph Losey
112 /Losey/Joseph

A Ella Fitzgerald sings George Gershwin
112 /Fitzgerald/Ella

X A manuscript letter written by the head of the India Office in 1873
132 /Great Britain/India Office

1X3 OTHER INTELLECTUAL RESPONSIBILITY

These tags identify the names of persons or bodies who have some measure of intellectual responsibility, other than those recognised by the relevant standard.

For example :

F Les Regles du Jeux a film by Jean Renoir subtitles Mai Harris
113 /Harris/Mai

B Angelique by Sergeanne Golon translated by Marguerite Barnett
113 /Barnett/Marguerite

1X4 SUBJECT NAMES

These tags identify the names of persons or bodies which are the subject of the document being catalogued.

F At your service, a film about the Crown Agents
134 /Crown Agents

B Charles Dickens by Angus Wilson
114 /Dickens/Charles

1X5 "ASSOCIATIVE" NAMES

These tags identify the names of persons or bodies which have a connection with the document being catalogued other than a relationship based on intellectual responsibility or a subject relationship.

For example :

X Letter from Benjamin Franklin to Gaetano Filangieri
115 /Filangieri/Gaetano

A "Recorded in the.... Library of Congress on the Stradivari instruments of the Gertrude Clarke Whittal Foundation
135 /Gertrude Clarke Whittal Foundation

1X6 REFFRENCES

These tags contain the tag and repeat of the field to which reference is made, the form of a name from which a reference is made, and the reference itself.

For example :

B 116 / 111 /Maurier/Dame/Daphne du/See/Du Maurier/Dame/Daphne

X 136 / 132 /India Office/See/Great Britain/India Office

2XX TITLE FIELDS

These fields contain title(s) and title information borne by the publication in hand or relating to that publication or the works to which it pertains.

20X UNIFORM TITLES

These fields contain the titles which have been chosen for cataloguing purposes to identify works which have appeared under varying titles.

201 UNIFORM TITLES IN THE LANGUAGE OF THE PUBLICATION

202 UNIFORM TITLES NOT IN THE LANGUAGE OF THE PUBLICATION

For example :

B Fiesta by Ernest Hemingway. Originally published as 'The sun also rises'
201 /The sun also rises

F The eclipse, a film by Michelangelo Antonioni
202 /L'Eclisse

B The Gospel of Mark
201 /Bible/New Testament/Mark/English

A Prelude : The afternoon of a faun. Music Treasures of the World. MT-20
202 /Prélude à l'après midi d'un faune

211 PARALLEL TITLES

This field contains the title of the document in another language when such titles appear on the publication.

For example :

S Journal of applied mathematics. Journal des mathématiques appliquées
211 /Journal des mathématiques appliquées

212 TRANSLITERATED TITLE

This field contains the transliterated title of a document when the title given in the 'title borne by the publication' field (261) is in a non-roman script.

For example :

B Title page - Αριστοφανους Νεφελαι
212 /Nephelai

213 ALTERNATIVE TITLE

This field contains the alternative title of a document when such a title is considered to be significant.

For example :

B Tom Jones, or, The history of a foundling
213 /The history of a foundling

B Julie, ou, La Nouvelle Héloïse
213 /La Nouvelle Héloïse

22X SUPPLIED TITLES

These fields contain descriptive titles or collective titles describing the publication when the publication lacks a title, or a collective title is required for filing purposes.

221	SUPPLIED TITLES	-	NO DOCUMENT TITLE PRESENT
222	" "	-	COLLECTIVE - COMPLETE
223	" "	-	- SELECTED
224	" "	-	- SELECTIONS
225	" "	-	- INDIVIDUAL GENRES

For example :

X 221 /Letter, 1847 June 2, Washington, DC, to James K Polk

221 /Proposed arsenal at Pittsburgh. Rendering, elevation, plans

X The complete musical works of G G Cambini
222 /Works

B Selected works of William Shakespeare
223 /Selected works

B Gems from Spinoza
224 /Selections

X G F Handel, Sonatas for flute and piano
225 /Sonatas, flute and continuo

X The records, 1816-1908, of the American Colonization Society
225 /Records, 1816-1908

B Selected poems of Robt Herrick
225 /Poems. Selected

231 KEY TITLE

This field contains the 'key title' of a serial, as defined by the International Serials Data System "Guidelines" + and by the International Standard Bibliographic Description for Serials. It is the title which is linked to the International Standard Serial Number.

For example :

S Transactions for the year. The Grotius Society
231 /Transactions for the year/The Grotius Society

S Actualités industrielles de Grande-Bretagne
231 /Actualités industrielles de Grande-Bretagne

S Journal of Health
231 /Journal of Health (Philadelphia)

232 ABBREVIATED TITLE

This field contains the abbreviated title of a serial, formulated according to a standard system. Compressed titles and similar serial title codings (e.g. CODEN) are included here.

For example :

S Journal of European Studies
232 /J. Eur. Stud.

S Indian Pediatrics
232 /INPD-A

244 TITLE AS SUBJECT

This field contains the titles of works which are the subject of the document being catalogued.

For example :

B Critical studies of 'Sir Gawain and the Green Knight'
244 /Sir Gawain and the Green Knight

B The language of Tennyson's 'In memoriam'
244 /In memoriam

+ To be published

256 TITLES AS REFERENCES

This field contains the field enumerator of the field to which reference is made, the form of a title from which a reference is to be made, and the reference itself.

For example:

B 256 '202/Song of Roland/See/Chanson de Roland

261 TITLES BORNE BY THE PUBLICATION

This field contains the principal title borne by the publication, any other titles borne by the publication, and any statement of intellectual responsibility transcribed from the publication.

For example:

F 261 /Cleanliness is happiness/Central Council for Health Education

F 261 /Dance moments from "Rio Rita"/the new musical play at the Prince Edward Theatre, London

X 261 /An introduction to automation/by Learning Systems Ltd.

F 261 /Saharan Oil/Pétrole Saharien/Compagnie Française des Pétroles

A 261 /Treasury of Bret Harte/read by Val Bettin

F 261 /On the Little Big Horn/or, Custer's last stand

X 261 /The need for redirected rural schools/address before the Iowa State Teachers' Association, (Des Moines), Oct 4, 1910/by Theodore Roosevelt

27X - 28X PRECEDING AND SUCCEEDING TITLES

These fields contain titles previously or successively borne by the document. The third character of the tag is used to define the exact relationship between these titles and the title of the work in hand.

271 CONTINUES

272 CONTINUES IN PART

273 SUPERSEDES

274 SUPERSEDES IN PART

275 AMALGAMATION OF

276 INCLUDES (WITHOUT CHANGING ITS OWN TITLE)

277 INCLUDES IN PART (WITHOUT CHANGING ITS OWN TITLE)

278 SPLIT OFF FROM (WITHOUT OTHER TITLE CHANGING)

279 RESUMES (SAME TITLE WITH SEPARATE CLOSED ENTRY)

281 CONTINUED BY

282 CONTINUED IN PART BY

283 SUPERSEDED BY

284 SUPERSEDED IN PART BY

285 AMALGAMATED WITH

286 INCLUDED BY (WITHOUT OTHER TITLE CHANGING)

287 INCLUDED IN PART BY (WITHOUT OTHER TITLE CHANGING)

288 SPLIT INTO

289 RESUMED AS (PREVIOUS TITLE, AFTER PERIOD AS TITLE IN HAND)

291 VOLUME, ISSUE OR PART NUMBERING/DESIGNATION/CITATIONS/DATE

This field contains the numbering, etc. of

1) a volume within a document
2) a document within a collection.

Also, if the part is not numbered but designated, or if it is designated as well as numbered, such a designation is included in this field. If the numbering is, or includes, a date, or is a citation numbering it is included in this field.

For example:

B A textbook of X-ray diagnosis by British authors. Volume 2
291 /Vol 2

B Dominoes by Dorothy Maud Glynn. Stage 5
291 /Stage 5

B Institution of Electrical Engineers monograph series 11
291 /11

B The School Mathematics Project. Book H
291 /Book H

S Who's who 1972
291 /1972

S You and your stars. Pisces
291 /Pisces

S 291 /Special issue, June 1970

S In 'Monthly digest of statistics', No 170, Feb 1960
291 /No. 170/Feb 1960

301 EDITION

This field contains the name or number of a new edition of a document, any statements of intellectual responsibility that are associated with that edition, and any supplementary statement on the edition.

B 301 /5th ed./by C Ellis

B 301 /4th ed./with notes, tables and considerable additions

31X PUBLICATION

These fields contain details of the place from which the document is issued, the name of the person or body who published, distributes, etc., the document, and the date of the document.

311 PUBLISHER

312 MANUFACTURER (INCLUDING PRINTER)

313 SPONSOR

314 DISTRIBUTOR

315 OTHER PUBLISHING OR ISSUING AGENCIES

For example :

B	311	/London/Heinemann/1971
F	312	/London/Shell Petroleum Co., Ltd./1960
F	314	/London/Shell-Mex and B.P. Ltd./1965
F	313	/New York/UN Film Board
B	311	/72 Dundas St./Edinburgh/Tragara Press/1972

351 PHYSICAL DESCRIPTION

This field contains information on :

1) The physical form designator of the material

2) Any necessary systems qualifier

3) A description of the extent of the document

4) The element of enrichment or other special descriptive detail such as illustrations, colour, etc., appropriate to the document

For example :

B	351	/Book/21 cm/3 vols (8591 pages)/col./ports.
B	351	/Book/20x20cm/84 pages /Book/20x20cm/48 pages/col. maps
F	351	/Film/35mm/10min/bw
F	351	/Film/35mm/silent/24 reels/bw
X	351	/Music score /20cm/63 pages /Music part/20cm/62 pages
X	351	/Wallchart/20x30in./colour
X	351	/Teaching machine programme/Grundy Tutor/249 frames
X	351	/Map set/25x35cm/9 sheets/coloured
X	351	/Typescript/20x20cm/1 page
A	351	/Disc set/stereo/78rpm/12in./6 sides
A	351	/Disc set/microgroove/mono/33⅓rpm/8 containers (114 sides)

4XX NOTES

These fields contain additional detail about the publication. They may repeat information given either in coded form in the information code field or elsewhere in the record, or be derived from this information.

402 NOTES ON NUMBERS

For example :

B	402	/Previously issued as ISBN 0 435 18353 2

41X NOTES RELATING TO NAMES

411 NOTES RELATING TO NAMES OF PERSONS OR BODIES BEARING INTELLECTUAL RESPONSIBILITY

For example :

B 411 /Previously published under the name Norman Vainmouse

414 NOTES RELATING TO SUBJECT NAMES

For example :

B 414 /Contains material on Lord Byron

415 NOTES RELATING TO ASSOCIATED NAMES

For example :

X 415 /Previous research sponsored by U.K.A.E.A.

42X NOTES RELATING TO TITLES

422 NOTES RELATING TO SUPPLIED TITLES

For example :

B 422 /Title supplied from previous edition

424 NOTES RELATING TO SUBJECT TITLES

For example :

B 424 /Includes material on the Gospel of St Matthew

426 NOTES RELATING TO TITLES BORNE BY THE PUBLICATION

For example :

B 426 /Previously published as "A bed of roses"

427 NOTES RELATING TO PRECEDING TITLES

For example :

S 427 /Continues the "Journal of Tribology"

428 NOTES RELATING TO SUCCEEDING TITLES

For example :

S 428 /Subsequent issues published as "New Library World"

429 NOTES RELATING TO VOLUME OR PART NUMBER ETC.

For example :

S 429 /Previous issues numbered 1-59

430 NOTES RELATING TO THE EDITION

This field includes 'bibliographic history' notes.

For example :

B 430 /Previous edition published 1941

B 430 /4th edition revised by Norman Wainmaring

431 NOTES RELATING TO THE PUBLICATION

For example :

B 431 /Also published, New York : Doubleday, 1971

B 431 /Printed in Czechoslovakia

435 NOTES RELATING TO PHYSICAL DESCRIPTION

For example :

X 435 /Also available on microfilm

B 435 /Printed on damp-proof paper

441 NOTES RELATING TO SERIES

This field contains a descriptive series or collection note when this differs substantially from the form of title and name contained in the 1XX and 2XX fields at the 1 or 2 level or when such fields are not present. This field does not create a collection entry.

For example :

B 441 /A Weidenfeld goldback book

B 441 /Labour pamphlet, No. 382

45X NOTES RELATING TO CLASSIFICATION MARKS

450 NOTES RELATING TO DECIMAL CLASSIFICATION NUMBERS

451 NOTES RELATING TO UNIVERSAL DECIMAL CLASSIFICATION NUMBERS

452 NOTES RELATING TO LIBRARY OF CONGRESS CLASSIFICATION NUMBERS

458 NOTES RELATING TO SPECIAL SUBJECT CLASSIFICATIONS

For example :

B 450 /Primary classification : 412

B 450 /Previously classified at : 511

460 NOTES RELATING TO VERBAL SUBJECT HEADINGS

For example :

B 460 /Includes material on Central America

465 NOTES ON TYPE OF PUBLICATION, GENRE, FORM, ETC.

For example :

B 465 /A bibliography

B 465 /"A fictional autobiography" - preface

466 NOTES ON LANGUAGE

For example :

F 466 /English dialogue, French subtitles

S 466 /Contains abstracts in French, German and Italian

467 SUMMARY, PRECIS, ABSTRACT NOTES

This field contains summary statements of the subject, scope, etc., of the documents.

F 467 /Life cycle of various kinds of spider - common cross, water, trap-door, bolus.

F - 467 /Shows adult ostriches performing mating display, ostrich eggs and young birds

468 CONTENTS AND PARTIAL CONTENTS NOTES

This field contains a contents or partial contents note when this differs substantially from the form of names and titles contained in the 1XX and 2XX fields at the 4-7 levels, or when such fields are not present.

For example :

A 468 /Partial Contents : Thomas, Dylan, Under Milk Wood - Peake, Mervyn, The Wild Man

B 468 /Includes 7 plays by Garcia Lorca

F 468 /Part 1 : The Heart. - Part 2 : Blood vessels and circulation.

469 PRODUCTION CREDIT NOTES

This field includes details of persons or bodies concerned with the production of a document, other than those noted in the statement of intellectual responsibility subfield.

For example :

F 469 /Produced by Vision Associates for National Education Association

F 469 /Costumes designed by June Blacksmith

470 PERFORMANCE CREDIT NOTES

This field includes details of persons or bodies concerned with the performance contained in a publication, other than those noted in the statement of intellectual responsibility subfield.

For example :

A 470 /Cast includes Sir Ralph Richardson as the Narrator, Sir Michael Redgrave, Walter Hudd, Peter Williams, Jack Gwillim, David John, Pauline Jameson, Doris Hare, Avril Elgar and Robert Stephens.

471 TARGET GROUP NOTE

This field contains details of the group for whom a work is specially intended.

For example :

F 471 /For post-graduate students of gynaecology.

472 USE NOTES

This field contains details of restrictions or limitations imposed on the use of a document.

For example :

B 472 /Issued to Metropolitan Police personnel only

X 472 /Closed to investigators until 1989

473 NOTES ON BIBLIOGRAPHIES, REFERENCES, ETC.

This field includes notes on bibliographies, references, etc., contained in a publication and of their extent.

For example:

B 473 /Bibliography (483 items)

S 473 /Bibliographic references p. 48-49

474 FREQUENCY NOTES

This field contains details of the frequency of a serial publication.

For example:

S 474 /10 issues a year

475 REGULARITY NOTES

This field contains details of the regularity of publication of a serial publication.

For example:

S 475 /Published at irregular intervals

476 REPOSITORY NOTES

This field contains details of the place at which a unique document (e.g. a manuscript) is held.

For example:

X 476 /In Radcliffe College, Schlesinger Library on the History of Women in America.

X 476 /Bodleian Library, MSS. (Bruce 96)

477 "WITH" NOTES

This field contains details of publication(s) with which the publication being catalogued has been issued.

For example:

F 477 /On reel with "They're in the Army now"

A 477 /With: Grieg (E.H.) Peer Gynt (Suite) No. 1-2. - Strauss (Richard) Till Eulenspiegels lustige Streiche

478 RELATIONSHIPS TO OTHER WORK NOTE

This field contains details of the relationship (other than bibliographic) between the publication in hand and other works.

For example:

B 478 /Based on the novel by Norbert Schrein

A 478 /Based on Victor Hugo's Angelo

X 478 /Original illustrations for 'Names and portraits of birds which interest gunners' by Gordon Trumbull

479 NOTES RELATING TO AVAILABILITY OF INDEXES, ABSTRACTS, REVIEWS, ETC.

For example:

S 479 /Indexed in 'Library Literature'. - Abstracted in 'Library and Information Science Abstracts'

F 479 /Refs. Sight and Sound, 2 (6), Summer, 1933, p.65

480 "SELF-KEY" NOTES

This field contains details of indexes, inventories of frames, contents lists etc.

For example :

S	480	/Cumulative index in Jan., Apr., July and Dec.
X	480	/Contains 3 figure index on frames 1 - 8.

481 PROJECT OR SPONSORING BODY OR UNIVERSITY NOTE

This field contains details of the project for which a document has been produced, the body under whose aegis a document has been produced, or the institution(in the case of a thesis, etc.) to which a document has been presented.

For example :

X	481	/Thesis for the Fellowship of the Library Association
X	481	/Report on research sponsored jointly by the Pig Industry Development Association and An Foras Taluntais

5XX CLASSIFICATION MARK FIELDS

These fields contain class marks drawn from classification schemes, secondary class marks, and verbal expressions of the subjects contained in the class mark.

501 DECIMAL CLASSIFICATION NUMBERS

502 DECIMAL CLASSIFICATION VERBAL FEATURES

For example :

501	/690.12
502	/Cavity walls. Metal ties. Specification.

511 UNIVERSAL DECIMAL CLASSIFICATION NUMBERS

512 UNIVERSAL DECIMAL CLASSIFICATION VERBAL FEATURES

For example :

511	/629.19.001.5
512	/Space research. Role of space flight. STUDY EXAMPLE : RESEARCH ON VAN ALLEN RADIATION BELTS

521 LIBRARY OF CONGRESS CLASSIFICATION NUMBERS

522 LIBRARY OF CONGRESS CLASSIFICATION VERBAL FEATURES

For example :

521	/LA 226
522	/History of higher education. United States

58X SPECIAL SUBJECT CLASSIFICATION FIELDS

NB. Unique fields to be allocated according to network requirements

6XX VERBAL SUBJECT DATA

These fields contain verbal subject data, and subject index data.

611 LIBRARY OF CONGRESS SUBJECT HEADINGS

For example:

611 /Art/History/19th century

651 SPECIAL VERBAL SUBJECT SYSTEM HEADINGS

68X SUBJECT INDEX DATA

Tags to be allocated to special schemes e.g. PRECIS

681 KEYWORD SUBJECT DATA

691 SECTIONAL HEADINGS FOR PUBLICATION ORGANISATION

3.4 REPEATS

Where there is more than one occurrence of a field at the same level such occurrences are signalled by a REPEAT character at input.

e.g. 4 112A /Gorman/Michael
4 112B /Smith/Henry

Subsequent recurrence of the 112 field at the 4 level would have the repeat digit C, D, E and so on.

The repeat characters at input translate into a further occurrence of a directory entry in the main record directory or associated subrecord directories.

3.5 INDICATORS

The following table of indicators provide for

i. indicating whether a title is a significant filing title or not

ii. indicating that data presented in field does not conform to standard* or may require editorial change when being used in a country other than that which produced the record

iii. indicating that information in a field is in coded form

iv. indicating that a field possesses special filing requirements, e.g., leading non-filing characters; substitute filing data embedded in field

v. indicating that name information in a publication statement repeats the primary name.

The number of indicators required is defined by the number of variant conditions which co-exist within a single field.

The indicators are stacked to restrict the number present in the record to the essential minimum.

* By 'standard' is meant conforming to internationally accepted standards.

FIRST INDICATOR

TITLE FIELDS

0 = NON-SIGNIFICANT - STANDARD+

1 = SIGNIFICANT - STANDARD

2 = NON-SIGNIFICANT - NON-STANDARD

3 = SIGNIFICANT - NON-STANDARD

4 = SIGNIFICANT - STANDARD - CODED

OTHER FIELDS

0 = STANDARD ; UNCODED

1 = STANDARD ; CODED

2 = NON-STANDARD

SECOND INDICATOR

Applies to any fields which become LEAD fields in filing (name, title, subject)++

0 = NO SPECIAL FILING CONDITION PRESENT

1 = NON-FILING CHARACTERS IN LEADING POSITION

2 = NON-FILING CHARACTERS IN LEADING POSITION AND INTERIOR FILING SUBSTITUTION DATA PRESENT

3 = INTERIOR FILING SUBSTITUTION DATA ONLY PRESENT

4 = FIRST BLANK OR PUNCTUATION SYMBOL SUPPRESSED IN FILING

In PUBLICATION fields the 2nd indicator is used as follows

0 = DOES NOT REPEAT PRIMARY

1 = REPEATS PRIMARY NAME

3.6 SUBFIELD CODES

Each field may contain more than one subfield. Each subfield is introduced by a SUBFIELD CODE consisting of an IDENTIFIER followed by a single ALPHABETIC CHARACTER.

The subfield IDENTIFIER is represented in this format by the dollar sign ($).

NOTE: Subfield codes may be repeated as required within any single field, and may be input in any order. The order used at input will generally reflect that of the natural sequence of the data.

+ By 'standard' is meant conforming to internationally accepted standards

++ NOTE : Use of filing indicator presupposes adoption of the 'bar technique' or similar provision

Subfield codes are listed below in the sequence of the blocks of tags to which they apply. With the exception of the general subfields, subfields apply to groups of related fields and are set out in a way which reflects this relationship.

The general subfields fall into a number of categories:

I. A subfield which meets the leader requirements and which will only be used in an implementation which otherwise would not carry subfield codes in data. This provision is made in order that a format implementation level based on punctuation alone may be carried out.

II. Field enumerator subfield which will be used in any field where the tag and repeat of another related field at the same level needs to be explicitly stated as, for example in references from alternative version of a name.

III. Generalised authority subfield which will be used to identify, when necessary, the standard used for the data following in the field, for example to identify the system of abbreviation used for a periodical title.

IV. Reserved subfields which may be allocated local or network significance, but would also carry information in international exchange. By reserving a group of subfields in this way a degree of insulation against local implementation requirements is provided to the system.

SUBFIELDS FOR GENERAL APPLICATION

$a	only subfield present
$b	field enumerator subfield
$c	authority subfield
$d)	
$e)	
$f)	Reserved subfields
$g)	

SUBFIELD CODES FOR SUPPLEMENTARY INFORMATION CODES FIELD (010)

$h	Main language	008* & 010
$i	Language(s) of alternative versions	010
$j	Supplementary language(s)	010
$k	Language translated from	010
$l	Transliteration code	010
$m	Date of creation	010
$n	Date of original publication	010
$o	Date of publication	008 & 010
$p	Date of manufacture	010
$q	Date of copyright	010
$r	Special date	010

* Those subfield codes marked 008 are used as input conventions for information to be included in the 008 field.

SUBFIELD CODES FOR SUPPLEMENTARY INFORMATION CODES FIELD (cont.)

$s	Chronological coverage	010
$t	Form of arrangement	008
$u	Genre	008
$v	Other types of publication	008
$w	Publication status	008
$x	Intellectual level	008
$y	Geographic area	008 & 010
$z	Country of publication	008 & 010

SUBFIELD CODES FOR NUMBER FIELDS (021 - 027)

$h	number
$i	alternative number
$j	preceding document number
$k	succeeding document number
$l	parallel document number
$m	explicit relationship
$n	format statement
$o	price

For example :

B ISBN and alternative ISBN

021 $h 0 85331 304 0 $i 0 85331 327 X $n Pbk $o £0.75

A Manufacturer's number and alternative manufacturer's number

023 $h NF-4 $i ZNF-4

SUBFIELD CODES FOR NAME FIELDS (111 - 136)

$h	Entry element of name
$i	Rest of personal name
$j	Titles of honour, address, etc.
$k	Epithets
$l	Dates
$m	Enumeration : Arabic
$n	Enumeration : Roman
$o	Subordinate body
$p	Inverted element of coporate name
$q	Rest of inverted name
$r	Form subheading

SUBFIELD CODES FOR NAME FIELDS (cont.)

$n Place

$t Second party to treaty

$u Topical subheading

$v Relator

$w Linking data in reference

$x Referred to form of data

For example :

111 $h Shakespeare $i William

111 $h Byron $i George Gordon Noel $j Baron Byron

112 $h Henry $j Mrs $i Robert

111 $h Fitz-James $i Edmond $j duc de

114 $h Johannes Diaconus $i 12th cent.

131 $h Conference on Biology $n 2nd $n Chicago $i 1971

112 $h Elizabeth $n II $j Queen of Great Britain

131 $h Great Britain $o India Office $o Library

131 $h Smiley $p A K $q Public Library

131 $h Great Britain $x Treaties, etc. $t Union of Soviet Socialist Republics $i July 6, 1949

134 $h St. Mary's Church $n Golders Green

114 $h Dickens $i Charles $u Characters

134 $h Library Association $u Mechanisation projects

116 $b 111 $h Maurier $j Dame $i Daphne du $w See $x Du Maurier $j Dame $i Daphne

111 $h Smith $i William $k poet

112 $h Chabrol $i Claude $v director

Note : Where a subfield code is repeated in a name field it will be represented in output listing in the order of input.

For example :

111 $h Beecham $i Sir $i Thomas $j Bart

114 $h Albert $j Prince Consort $j Consort of Queen Victoria, Queen of Great Britain

SUBFIELD CODES FOR TITLE FIELDS (201 - 291)

- $h Entry element of title
- $i Part of work. Collective subtitle
- $j Language
- $k Version
- $l Dates
- $m Country
- $n Other qualifications added to title
- $o Other titles (including sub-title information)
- $p Parallel titles
- $q Alternative titles
- $r "Author statement" repeating primary name
- $s "Author statement" not repeating primary name
- $x Other statements
- $u Volume number or designation
- $v Volume number or designation alternative
- $w Linking data in reference
- $x Referred to form of data

For example:

201 $h Bible $i New Testament $i Mark $j English $k Authorized $l 1967

201 $h Genesis $n Anglo-Saxon poem

261 $h Saharan oil $p Pétrole saharien $m France

261 $h Correspondence, 1821-79 $r of William Allen

261 $h A Beethoven suite $s arr. by Alan Frank and Watson Forbes for B flat clarinet and piano

291 $u Stage 5

291 $u Part 7 - 18 $v 1916-27

256 $b 202 $h Song of Roland $w See $x Chanson de Roland $j English

SUBFIELD CODES FOR EDITION FIELD (301)

- $h Edition statement
- $i Edition author statement
- $j Supplementary edition statement

For example:

B 301 $h 5th ed. $i by C. Ellis

B 301 $h 4th ed. $j with notes, tables and considerable additions

SUBFIELD CODES FOR PUBLICATION FIELDS (311 - 318)

$h Place

$i Address

$j Name of publisher, sponsor etc.

$k Date

For example :

B 311 $h London $j Heinemann $k 1971

F 314 $h London $j Shell-Mex and B.P. Ltd. $k 1965

SUBFIELD CODES FOR PHYSICAL DESCRIPTION FIELD (351)

$h Physical form designator

$i Systems qualifier

$j Element of extent

$k Element of enrichment

For example :

F 351 $h Film $i 35mm $j 10 mins. $k B. & W.

X 351 $h Map set $j 25 x 35cm. $j 9 sheets $k Col.

B 351 $h Book $j 21 cm. $j 3 vols (8591 pages) $k col. illus. $k ports

SUBFIELD CODES FOR NOTE FIELDS (402 - 481)

$h (Only subfield present)

For example :

F 467 $h Life cycle of various kinds of spider

SUBFIELD CODES FOR SUBJECT FIELDS (501 - 691)

$h Classification mark

$i Call mark

$j Verbal subject statement

$k Topic sub-heading

$l Place sub-heading

$m Date sub-heading

$n Form sub-heading

For example :

B 501 $h 690.12

611 $i Education $l Germany $m 1972 $n Bibliography

APPENDIX 1 - MEDIA CODE EXAMPLE

Extract from College Bibliocentre Catalogue Data Base Code

001	Large Print
002	Pamphlet
003	Sheet Music
004	Business Forms
005	Illustrations, Art Prints, Reproduction, Picture and Study Prints
006	Flash Cards, Educational Game Cards
007	Flip Charts
008	Posters - Advertisement
009	Charts, Information Arranged in Tabular and Diagrammatic Order, Includes Flow Charts
010	Maps
011	Charts, Navigational
012	Plans
013	Globes
014	Relief Models
015	Realia or Specimens
016	Kit (No Equipment Required)
017	Diorama
018	Model
019	Braille
020	Transparencies, Less than 10" x 10"
021	Transparencies, with Overlays or in Book Form, Less than 10" x 10"
022	Transparencies, 10" x 10"
023	Transparencies, with Overlays or in Book Form, 10" x 10"
024	Transparency Masters, Less than 10" x 10"
025	Transparency Masters, 10" x 10"
026	Laboratory Kit - Individual Study and Destruction
027	Game - Set of Materials Designed for Play or Competition - Equipment not Required
028	Game - Equipment Required
029	Multi-media Kit - Playback or Viewing Equipment Required
030	Slides 2 x 2 Colour
031	Slides 2 x 2 Black and White
032	Slides 2-1/4 x 2-1/4 Colour
033	Slides 2-1/4 x 2-1/4 Black and White
034	Slides 3-1/4 x 4 Colour
035	Slides 3-1/4 x 4 Black and White
036	Slides Stereoscopic Colour
037	Slides Stereoscopic Black and White
038	Slides Microscopic Colour
039	Slides Microscopic Black and White
040	Filmslip - Colour
041	Filmslip - Black and White
042	Filmstrip - 35mm - Colour
043	Filmstrip - 35mm - Black and White
044	Filmstrip - 35mm - Double Frame - Colour
045	Filmstrip - 35mm - Double Frame - Black and White
046	Filmstrip - 16mm - Colour
047	Filmstrip - 16mm - Black and White
048	Filmstrip - 8mm - Colour
049	Filmstrip - 8mm - Black and White
050	Filmstrip - Super 8 - Colour
051	Filmstrip - Super 8 - Black and White
060	Filmloop - 8mm - Colour
061	Filmloop - 8mm - Black and White
062	Filmloop - Super 8 - Colour
063	Filmloop - Super 8 - Black and White
100	Film - 8mm - Magnetic Sound - Colour
101	Film - 8mm - Magnetic Sound - Black and White
102	Film - 8mm - Optical Sound - Colour
103	Film - 8mm - Optical Sound - Black and White
104	Film - 8mm - Silent - Colour
105	Film - 8mm - Silent - Black and White
106	Film - Super 8 - Magnetic Sound - Colour
107	Film - Super 8 - Magnetic Sound - Black and White
108	Film - Super 8 - Optical Sound - Colour
109	Film - Super 8 - Optical Sound - Black and White
110	Film - Super 8 - Silent - Colour
111	Film - Super 8 - Silent - Black and White
112	Film - 8mm - Cartridge - Colour
113	Film - 8mm - Cartridge - Black and White
114	Film - Super 8 - Cartridge - Colour
115	Film - Super 8 - Cartridge - Black and White
120	Film - 9.5mm - Magnetic Sound - Colour
121	Film - 9.5mm - Magnetic Sound - Black and White
122	Film - 9.5mm - Optical Sound - Colour
123	Film - 9.5mm - Optical Sound - Black and White
124	Film - 9.5mm - Silent - Colour
125	Film - 9.5mm - Silent - Black and White
126	Film - 9.5mm - Cartridge - Colour
127	Film - 9.5mm - Cartridge - Black and White

130 Film - 16mm - Magnetic Sound - Colour
131 Film - 16mm - Magnetic Sound - Black and White
132 Film - 16mm - Optical Sound - Colour
133 Film - 16mm - Optical Sound - Black and White
134 Film - 16mm - Silent 24 F.P.S. - Colour
135 Film - 16mm - Silent 16 F.P.S. - Black and White
136 Film - 16mm - Cartridge - Colour
137 Film - 16mm - Cartridge - Black and White
138
139
140
141
142 Film - 28mm - Magnetic Sound - Colour
143 Film - 28mm - Magnetic Sound - Black and White
144 Film - 28mm - Optical Sound - Colour
145 Film - 28mm - Optical Sound - Black and White
146 Film - 28mm - Silent - Colour
147 Film - 28mm - Silent - Black and White
148 Film - 28mm - Cartridge - Colour
149 Film - 28mm - Cartridge - Black and White
150
151
152
153
154 Film - 35mm - Magnetic Sound - Colour
155 Film - 35mm - Magnetic Sound - Black and White
156 Film - 35mm - Optical Sound - Colour
157 Film - 35mm - Optical Sound - Black and White
158 Film - 35mm - Silent - Colour
159 Film - 35mm - Silent - Black and White
160
161
162
163
164
165
166
167
168
169 Film - 70mm - Magnetic Sound - Colour
170 Film - 70mm - Magnetic Sound - Black and White
171 Film - 70mm - Optical Sound - Colour
172 Film - 70mm - Optical Sound - Black and White
173 Film - 70mm - Silent - Colour
174 Film - 70mm - Silent - Black and White
175
176
177
178
179
180
181
182
183 Videotape - 2in. - HiBand Colour - Compatible
184 Videotape - 2in. - LoBand Colour - Compatible
185 Videotape - 2in. - Black and White - Compatible
186 Videotape - 2in. - Sony - Colour
187 Videotape - 2in. - Sony - Black and White
188 Videotape - 2in. - Ampex - Colour
189 Videotape - 2in. - Ampex - Black and White
190 Videotape - 1in. - Ampex - Colour
191 Videotape - 1in. - Ampex - Black and White
192 Videotape - 1in. - Philips - Colour
193 Videotape - 1in. - Philips - Black and White
194 Videotape - 1in. - Sony - Colour
195 Videotape - 1in. - Sony - Black and White
196 Videotape - 1in. - I.V.C. - Colour
197 Videotape - 1in. - I.V.C. - Black and White
198 Videotape - 1in. - Panasonic - Colour
199 Videotape - 1in. - Panasonic - Black and White

200	Videotape - 1in. - Concord - Colour
201	Videotape - 1in. - Concord - Black and White
202	
203	
204	Videotape - 1in. - Apeco - Colour
205	Videotape - 1in. - Apeco - Black and White
206	Videotape - 1in. - Bell & Howell - Colour
207	Videotape - 1in. - Bell & Howell - Black and White
208	Videotape - 1in. - Quality Electronics - Colour
209	Videotape - 1in. - Quality Electronics - Black and White
210	Videotape - 1in. - R.C.A. - Colour
211	Videotape - 1in. - R.C.A. - Black and White
212	
213	
214	
215	Videotape - 1in. - Shibaden - Colour
216	Videotape - 1in. - Shibaden - Black and White
217	
218	
219	
220	
221	Videotape - 1/2in. - Compatible - Colour
222	Videotape - 1/2in. - Compatible - Black and White
223	Videotape - 1/2in. - Concord - Colour
224	Videotape - 1/2in. - Concord - Black and White
225	Videotape - 1/2in. - Craig - Colour
226	Videotape - 1/2in. - Craig - Black and White
227	Videotape - 1/2in. - G.B.C. - Colour
228	Videotape - 1/2in. - G.B.C. - Black and White
229	Videotape - 1/2in. - 3M - Colour
230	Videotape - 1/2in. - 3M - Black and White
231	Videotape - 1/2in. - Panasonic - Colour
232	Videotape - 1/2in - Panasonic - Black and White
233	Videotape - 1/2in. - Sony - Colour
234	Videotape - 1/2in. - Sony - Black and White
235	
236	
237	
238	
239	Videotape - 1/4in. - Rheem - Colour
240	Videotape - 1/4in. - Rheem - Black and White
241	
242	
243	
244	
245	Videocassette - 3/4in. - Compatible - Colour
246	Videocassette - 3/4in. - Compatible - Black and White
247	Videocassette - 1/2in. - Compatible - Colour
248	Videocassette - 1/2in. - Compatible - Black and White
249	
250	
251	
252	
253	
254	
255	Electronic Video Recording - Colour
256	Electronic Video Recording - Black and White
257	Videodisc - Colour
258	Videodisc - Black and White
259	
260	
261	
262	
263	
264	
265	Audiotape - Single Track - 1-7/8 I.P.S.
266	Audiotape - Single Track - 3-3/4 I.P.S.
267	Audiotape - Single Track - 7-1/2 I.P.S.
268	Audiotape - Double Track - 1-7/8 I.P.S. - Mono
269	Audiotape - Double Track - 1-7/8 I.P.S. - Stereo

270 Audiotape - Double Track - 3-3/4 I.P.S. - Mono
271 Audiotape - Double Track - 3-3/4 I.P.S. - Stereo
272 Audiotape - Double Track - 7-1/2 I.P.S. - Mono
273 Audiotape - Double Track - 7-1/2 I.P.S. - Stereo
274 Audiotape - Four Track - 1-7/8 I.P.S. - Mono
275 Audiotape - Four Track - 1-7/8 I.P.S. - Stereo
276 Audiotape - Four Track - 3-3/4 I.P.S. - Mono
277 Audiotape - Four Track - 3-3/4 I.P.S. - Stereo
278 Audiotape - Four Track - 7-1/2 I.P.S. - Mono
279 Audiotape - Four Track - 7-1/2 I.P.S. - Stereo

280 Audiotape - 12in. reel - 1-7/8 I.P.S. - Mono
281 Audiotape - 12in. reel - 1-7/8 I.P.S - Stereo
282 Audiotape - 12in. reel - 3-3/4 I.P.S. - Mono
283 Audiotape - 12in. reel - 3-3/4 I.P.S. - Stereo
284 Audiotape - 12in. reel - 7-1/2 I.P.S. - Mono
285 Audiotape - 12in. reel - 7-1/2 I.P.S. - Stereo
286
287
288
289

290
291
292
293
294 Audiocartridge - Single Track
295 Audiocartridge - Double Track - Mono
296 Audiocartridge - Double Track - Stereo
297 Audiocartridge - Four Track - Mono
298 Audiocartridge - Four Track - Stereo
299 Audiocartridge - Eight Track - Mono

300 Audiocartridge - Eight Track - Stereo
301 Audiocartridge - Twelve Track - Mono
302 Audiocartridge - Twelve Track - Stereo
303 Audiocassette - Single Track
304 Audiocassette - Double Track - Mono
305 Audiocassette - Double Track - Stereo

306 Audiocassette - Four Track - Mono
307 Audiocassette - Four Track - Stereo
308
309

310
311
312
313
314
315 Audiodisc - 16-2/3 R.P.M. - Stereo
316 Audiodisc - 16-2/3 R.P.M. - Mono
317 Audiodisc - 33-1/3 R.P.M. - Stereo
318 Audiodisc - 33-1/3 R.P.M. - Mono
319 Audiodisc - 45 R.P.M. - Stereo
320 Audiodisc - 45 R.P.M. - Mono
321 Audiodisc - 78 R.P.M. - Stereo
322 Audiodisc - 78 R.P.M. - Mono
323 Audiodisc - Over 12in. - Stereo
324 Audiodisc - Over 12in. - Mono

400 Microfilm - 150mm. - Positive - Mono
401 Microfilm - 150mm - Negative - Mono
402 Microfilm - 125mm - Positive - Mono
403 Microfilm - 125mm - Negative - Mono
404 Microfilm - 105mm - Positive - Mono
405 Microfilm - 105mm - Negative - Mono
406 Microfilm - 70mm - Positive - Mono
407 Microfilm - 70mm - Negative - Mono

410 Microfilm - 150mm - Positive - Colour
411 Microfilm - 150mm - Negative - Colour
412 Microfilm - 125mm - Positive - Colour
413 Microfilm - 125mm - Negative - Colour
414 Microfilm - 105mm - Positive - Colour
415 Microfilm - 105mm - Negative - Colour
416 Microfilm - 70mm - Positive - Colour
417 Microfilm - 70mm - Negative - Colour

420 Microfilm - 35mm - Negative - Mono
421 Microfilm - 35mm - Positive - Mono
422 Microfilm - 35mm - Cartridge - 3M - Negative - Mono
423 Microfilm - 35mm - Cartridge - 3M - Positive - Mono
424 Microfilm - 35mm - Cartridge - Recordak - Negative - Mono
425 Microfilm - 35mm - Cartridge - Recordak - Positive - Mono
426 Microfilm - 35mm - Cartridge - Compatible - Negative - Mono
427 Microfilm - 35mm - Cartridge - Compatible - Positive - Mono

430 Microfilm - 35mm - Negative - Colour
431 Microfilm - 35mm - Positive - Colour
432 Microfilm - 35mm - Cartridge - 3M - Negative - Colour
433 Microfilm - 35mm - Cartridge - 3M - Positive - Colour
434 Microfilm - 35mm - Cartridge - Recordak - Negative - Colour
435 Microfilm - 35mm - Cartridge - Recordak - Positive - Colour
436 Microfilm - 35mm - Cartridge - Compatible - Negative - Colour
437 Microfilm - 35mm - Cartridge - Compatible - Positive - Colour

440 Microfilm - 16mm - Negative - Mono
441 Microfilm - 16mm - Positive - Mono
442 Microfilm - 16mm - Cartridge - 3M - Negative - Mono
443 Microfilm - 16mm - Cartridge - 3M - Positive - Mono
444 Microfilm - 16mm - Cartridge - Recordak - Negative - Mono
445 Microfilm - 16mm - Cartridge - Recordak - Positive - Mono
446 Microfilm - 16mm - Cartridge - Compatible - Negative - Mono
447 Microfilm - 16mm - Cartridge - Compatible - Positive - Mono

450 Microfilm - 16mm - Negative - Colour
451 Microfilm - 16mm - Positive - Colour
452 Microfilm - 16mm - Cartridge - 3M - Negative - Colour
453 Microfilm - 16mm - Cartridge - 3M - Positive - Colour
454 Microfilm - 16mm - Cartridge - Recordak - Positive - Colour
455 Microfilm - 16mm - Cartridge - Recordak - Negative - Colour
456 Microfilm - 16mm - Cartridge - Compatible - Positive - Colour
457 Microfilm - 16mm - Cartridge - Compatible - Negative - Colour

460 Microfilm - 8mm - Positive - Mono
461 Microfilm - 8mm - Negative - Mono
462 Microfilm - 8mm - Cartridge - Positive - Mono
463 Microfilm - 8mm - Cartridge - Negative - Mono

470 Microfilm - 8mm - Positive - Colour
471 Microfilm - 8mm - Negative - Colour
472 Microfilm - 8mm - Cartridge - Positive - Colour
473 Microfilm - 8mm - Cartridge - Negative - Colour

500 Microfiche - 148 x 210cm - upto 29:1 - Positive - Mono
501 Microfiche - 148 x 210cm - upto 29:1 - Negative - Mono
502 Microfiche - 148 x 210cm - upto 29:1 - Positive - Colour
503 Microfiche - 148 x 210cm - upto 29:1 - Negative - Colour
504 Microfiche - 148 x 210cm - 30-60:1 - Positive - Mono
505 Microfiche - 148 x 210cm - 30-60:1 - Negative - Mono
506 Microfiche - 148 x 210cm - 30-60:1 - Positive - Colour
507 Microfiche - 148 x 210cm - 30-60:1 - Negative - Colour
508 Microfiche - 148 x 210cm - Ultra high - Positive - Mono
509 Microfiche - 148 x 210cm - Ultra high - Negative - Mono

510 Microfiche - 148 x 210cm - Ultra high - Positive - Colour
511 Microfiche - 148 x 210cm - Ultra high - Negative - Colour
512 Microfiche - 105 x 148cm - upto 29:1 - Positive - Mono
513 Microfiche - 105 x 148cm - upto 29:1 - Negative - Mono
514 Microfiche - 105 x 148cm - upto 29:1 - Positive - Colour
515 Microfiche - 105 x 148cm - upto 29:1 - Negative - Colour
516 Microfiche - 105 x 148cm - 30-60:1 - Positive - Mono
517 Microfiche - 105 x 148cm - 30-60:1 - Negative - Mono
518 Microfiche - 105 x 148cm - 30-60:1 - Positive - Colour
519 Microfiche - 105 x 148cm - 30-60:1 - Negative - Colour

520 Microfiche - 105 x 148cm - Ultra high - Positive - Mono
521 Microfiche - 105 x 148cm - Ultra high - Negative - Mono
522 Microfiche - 105 x 148cm - Ultra high - Positive - Colour
523 Microfiche - 105 x 148cm - Ultra high - Negative - Colour
524 Microfiche - 75 x 125cm - upto 29:1 - Positive - Mono
525 Microfiche - 75 x 125cm - upto 29:1 - Negative - Mono
526 Microfiche - 75 x 125cm - upto 29:1 - Positive - Colour
527 Microfiche - 75 x 125cm - upto 29:1 - Negative - Colour
528 Microfiche - 75 x 125cm - 30-60:1 - Positive - Mono
529 Microfiche - 75 x 125cm - 30-60:1 - Negative - Mono

530 Microfiche - 75 x 125cm - 30-60:1 - Positive - Colour
531 Microfiche - 75 x 125cm - 30-60:1 - Negative - Colour
532 Microfiche - 75 x 125cm - Ultra high - Positive - Mono
533 Microfiche - 75 x 125cm - Ultra high - Negative - Mono

534 Microfiche - 75 x 125cm - Ultra high - Positive - Colour
535 Microfiche - 75 x 125cm - Ultra high - Negative - Colour

550 Aperture Card - 35mm - Positive - Mono
551 Aperture Card - 35mm - Negative - Mono
552 Aperture Card - 35mm - Positive - Colour
553 Aperture Card - 35mm - Negative - Colour

560 Aperture Card - 16mm - Positive - Mono
561 Aperture Card - 16mm - Negative - Mono
562 Aperture Card - 16mm - Positive - Colour
563 Aperture Card - 16mm - Negative - Colour
564 Aperture Card - 8mm - Positive - Mono
565 Aperture Card - 8mm - Negative - Mono
566 Aperture Card - 8mm - Positive - Colour
567 Aperture Card - 8mm - Negative - Colour

570 Microtext Chip/Strip forms - upto 29:1 - Positive - Mono
571 Microtext Chip/Strip forms - upto 29:1 - Negative - Mono
572 Microtext Chip/Strip forms - upto 29:1 - Positive - Colour
573 Microtext Chip/Strip forms - upto 29:1 - Negative - Colour
574 Microtext Chip/Strip forms - 30-60:1 - Positive - Mono
575 Microtext Chip/Strip forms - 30-60:1 - Negative - Mono
576 Microtext Chip/Strip forms - 30-60:1 - Positive - Colour
577 Microtext Chip/Strip forms - 30-60:1 - Negative - Colour
578 Microtext Chip/Strip forms - Ultra high - Positive
579 Microtext Chip/Strip forms - Ultra high - Negative

590 Micro-Opaque - 148 x 225
591 Micro-Opaque - 148 x 200
592 Micro-Opaque - 75 x 125
593 Micro-Opaque - Strip

600 EDP - Punched Cards

610 EDP - Paper Tape

620 EDP - Magnetic Tape

630 EDP - Disc

640 EDP - Drum

650 EDP - Data Cell

800 Programmed Instruction Using Special Equipment

810 Programmed Instruction Using Electronic Computers

901 Serials, Periodicals

DRAFT EUDISED FORMAT

APPENDIX IA - MEDIA CODE EXAMPLE

Extract from Easy method for inventory-taking and classification of audio-visual media, 1st ed. revised, by Françoise Lamy-Rousseau, Longue[illegible] Québec.

DIVISIONS

B - C Magnetic Recordings

B Magnetic Tapes, Reels

Width 1/4"	Width 1/2"	Width 1"	Width 2"
Diameter	Diameter	Diameter	Diameter
BA 3"	BL 7"	BR 10,1/2"	BU 10,1/2"
BB 4"	BM 8,3/4"	BS 14"	BV others
BC 4,1/4"	BN 10,1/2"	BT others	
BD 5"	BP 14"		
BE 5,3/4"	BQ others		
BF 7"			
BG 8,3/4"			
BH 10,1/2"			
BK others			

CA Magnetic Tapes, Cassettes

CB Magnetic Tapes, Cartridge-loops

CC Computer Tapes, Reels CC 556 bpi CD 800 bpi CE 1600 bpi

CF " " Canisters

CG " " Slim Line Canisters

CH " " Tapered Canisters

CJ " " Tape-seals

CK " " Self Feeding Cartridges

CL " " Cartridges for "Selectric Composers" & "Data Inscribers"

CM Magnetic Cards

CN Magnetic Disks

CP Magnetic Sound Sheets

CU Magnetic Belts

CV Magnetic Wires

D Other sound recordings:

DA - DE	Phonodisks
DF	Soundsheets
DL	Disks laterally cut
DP	Phonocylinders
DR	Phonorolls

E Equipment

F Motion pictures:

FA	70mm Films
FB	35mm Films
FC	16mm Films
FD	Films, Special sizes
FE	Super 8mm films
FG	8mm films
FI	Film clips
FT - FU	Videotapes
FV	" Cassettes
FW	Videofilms
FY	Special videofilms
FZ	Videodisks

G Still projections:

GF	Filmstrips 35mm
GH	Sound Filmstrips
GP	Slides
GQ	Slides and Sound
GS	Stereoscopic slides
GT - GU	Transparencies

H Microscope slides:

HM	Slides (glass)

K Kits

KA	Kits
KL	Laboratory kits
KM	Multi-media kits

M Microcopies

MA	Microfilms
MB	Strip microfilms
MC	Aperture cards
MF	Microfiches
MJ	Jackets
MM	Micro-microfiches
MP	Opaque microcopies
MR	Micro-opaque cards

P Graphic Materials

PA	Pictures
PB	Study prints
PC	Cards
PD	Graphs, charts and diagrams
PE	Printed programmed instruction texts
PF	Stereographs
PG	Geographical maps
PH	Photographs
PJ	Newspaper and periodical clippings
PL	Art prints
PM	Collages
PO	Computer documents
PP	Drawings and paintings
PR	Architectural and technical drawings
PS	Sheet music
PT	Tests
PU	Cels (with opaque drawings)

T Three dimensional learning materials

- TC Costumes
- TD Dioramas
- TE Exhibits
- TF Panel display materials
- TG Globes
- TJ Games
- TM Mockups
- TP Puppets
- TR Relief models
- TS Realia, specimens
- TT Operable transparencies
- TU Ceramics
- TV Enamels
- TW Masks

V Books

- VA Atlases
- VB Volumes
- VC Textbooks
- VD Dictionaries and encyclopedias
- VE Children's books
- VF Catalogues
- VG Brochures
- VH Leaflets
- VJ Newspapers
- VM Manuscripts
- VP Magazines
- VT Theses

X Devices

DRAFT REVISED FORMAT

APPENDIX II - WORKED EXAMPLES

Example 1: JOURNAL - COLLECTION/TWO ARTICLES

```
     001          0000-0000/7412/8
10   131  00  $h Library Association #
10   261  00  $h Library Association record $o official journal of the Library Association #
10   311  01  $h London $i 7 Ridgmount Street, WC1E 7AE $j L.A. #
10   351  00  $j 30 cm. #
40   291  00  $u Vol. 74, no. 12 $v December 1972 #
70   131A 00  $h Association of University Teachers #
70   131B 00  $h Library Association #
70   261  10  $h Salary scales in university libraries $o joint statement $h by the Association of
                 University Teachers and the Library Association #
70   351  00  $j p. 239 #
70   479  00  $h Contains abstract #
71   111A 00  $h Peacock $i P.G. #
71   111B 00  $h Cameron $i Kenneth J. #
71   261  11  $h The Open University summer school at the University of Stirling $o report on
                 library usage $h (by) P.G. Peacock, Kenneth J. Cameron #
71   351  00  $j p. 237-238 #
71   479  00  $h Contains abstract #
```

Example 2: MANUSCRIPT COLLECTION/DOCUMENT

```
10   261  11  $h The Alfred Whital Stem collection of Lincolniana, 1837-1912 #
10   351  00  $j 145 items #
10   476  00  $h In Radcliffe College, Schlesinger Library #
10   435  00  $h In part, transcripts #
10   465  00  $h Correspondence, reports, notes, etc. #
10   472  00  $h Open to investigators under Library restrictions #
10   415  00  $h Gift of A. Whital Stem, 1963 #
10   468  00  $h Contains Lincoln's will #
10   115  00  $h Stem $i Alfred Whital #
10   114  00  $h Lincoln $i Abraham $u Manuscript collections #
10   132  00  $h Radcliffe College $o Schlesinger Library $v MSS #
30   111  00  $h Lincoln $i Abraham #
30   221  00  $h Will, 1864 May 4 #
30   351  00  $j (30) p. $j 31 cm. #
30   435  00  $h Ms. copy of original, written in Washington D.C. #
30   415  00  $h Witnesses: Seward Hollins, London Jones #
30   115A 00  $h Hollins $i Seward #
30   115B 00  $h Jones $i London #
```

Example 3 : BOOK - DOCUMENT/ANALYTICAL

001 0 14 046 166 3

30 021 00 $h ISBN 0 14 046166 3 $n Paperback $o £0.20 #
30 111 00 $h Orwell $i George #
30 225 00 $h Essays. Selected #
30 261 10 $h Inside the whale $o and other essays $r (by) George Orwell $s edited by Rayner Heppenstall #
30 311 00 $h Harmondworth $j Penguin Books $k 1962 (1964 reprint) #
30 312 00 $h London $j Whitefriars Press #
30 351 00 $j 203 p. $j 18 cm. #
30 430 00 $h This selection originally published as 'Selected essays', 1957 #
30 112 00 $h Heppenstall $i Rayner #
30 501 00 $h 823.4 #
30 651 00 $j English literature $m 1900-1950 $n Essays #
30 116 00 $b 111 $h Blair $i Eric $w See $x Orwell, George #

50 111 00 $h Orwell $i George #
50 261 10 $h Boys' weeklies $r by George Orwell #
50 351 00 $j p. 175-203 #
50 430 00 $h Originally published in 'Critical essays', 1946 #
50 501 00 $h 052 #
50 651 00 $j Periodicals for boys $k English $m 1900-1945
50 116 00 $b 111 $h Blair $i Eric $w See $x Orwell, George #

Example 4 : MAP - DOCUMENT

001 11-11-11-11-3

30 021 00 $h ISMN 11-11-11-11-3 $o £0.50 #
30 131 00 $h Gall and Inglis $k Firm #
30 261 10 $h Tourist map of the Cumberland and Westmorland Lake District $s drawn by H. Pollock #
30 311 01 $h Edinburgh $j Gall and Inglis $k (1950?) #
30 351 00 $h Map. Scale 1:126, 720 $k Col. $j 86 x 63 cm. fold to 22 x 8 cm. #
30 112 00 $h Pollock $i H #
30 651 00 $j Lake District $n Maps #
30 501 00 $h 914.28 #

Example 5 : DISC - DOCUMENT/ANALYTICAL

001 0130209

30 023 00 $h CSD 3696 $o £2.00 #
30 111 00 $h Harby $i Hamilton $v composer #
30 261 11 $h A John Field suite (and other works) $r by Hamilton Harby #
30 311 00 $h London $j HMV $k 1971 #
30 351 00 $h Phonodisc $j 2s. $k microgroove, stereo, 33.$\frac{1}{3}$ rpm $j 12 in. #
30 468 00 $h Contains works by Bax and Cox #

50 291 00 $u Side 2, Band 2 #
50 111 00 $h Bax $j Sir $i Arnold #
50 261 10 $h Dance in the sunlight $r (by) A. Bax $s arr. Norbert Home English Sinfonia, Neville Dilks (conductor) #
50 351 00 $j 15 min. #
50 112A 00 $h Home $i Norbert $v arr. #
50 132 00 $h English Sinfonia $k Orchestra #
50 112B 00 $h Dilks $i Neville $v conductor #

Example 6: BOOK - SERIES/DOCUMENT/TWO ANALYTICALS

```
     001          0 586 08098 8

10   261  10  $h Eritharmon Press Gissing series $s edited by Pierre Constillas #
10   291  00  $u Vol. 1 - #
10   311  00  $h London $j Eritharmon Press $k 1969 - #
10   112  00  $h Constillas $i Pierre #

30   021  00  $h ISBN 0 586 08098 8 $o £1.625 #
30   261  10  $h Gissing East and West $o Four aspects $s (by) Shigeru Koike (and others) #
30   311  00  $h London $j Eritharmon Press $k 1970 #
30   312  00  $h Stoke Ferry $j Daedalus Press #
30   351  00  $j (6), 30, (4) p. $j 22 cm. $k ill., facsims #
30   435  00  $h 'This edition consists of 300 numbered copies' - note #
30   468  00  $h Contents: Gissing in Japan/Shigeru Koike - Gissing and I/Giichi Kanco -
                Gissing from a bookseller's point of view/ C.C. Kohler - Collecting George Gissing/
                Pierre Constillas #
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30   114A 00  $h Gissing $i George $u Japanese viewpoints #
30   114B 00  $h Gissing $i George $u Collecting #

50   111  00  $h Koike $i Shigeru #
50   261  10  $h Gissing in Japan $s translated from the Japanese and revised by the author and
                Jacob Korg #
50   351  00  $j p. 1-13 $k ill. #
50   430  00  $h Translation originally published in 'Bulletin of the New York Public Library',
                Nov. 1963 - Originally published in Japanese in 'Comparative Literature' 1953 #
50   112  00  $h Korg $i Jacob #

51   111  00  $h Constillas $i Pierre #
51   261  10  $h Collecting George Gissing $r by Pierre Constillas #
51   351  00  $j p. 21-30 #
51   430  00  $h Originally published in 'Book Collecting and Library Monthly', Dec. 1968 #
```

Example 7: BOOK - DOCUMENT/3 VOLUMES

001 04 921010 6

30 111 00 $h Russell $i Bertrand $j Earl Russell #
30 261 01 $h The autobiography of Bertrand Russell #
30 311 00 $h London $j Allen and Unwin $k 1967 - 1969 #
30 351 00 $j 3 vol. $j 24 cm. $k ill. ports. facsims #
30 651 00 $j Philosophers, English $n Biographies #

40 021 00 $h 04 921011 8 $o £2.10 #
40 291 00 $u 1872-1914 #
40 311 00 $h London $j Allen &Unwin $k 1967 #
40 351 00 $j 230, (16) p. $j 24 cm. $k ill. ports #
40 468 00 $h Contains letters to and from Russell #
40 480 00 $h Contains index #

41 021 00 $h 04921012 4 $o £2.10 #
41 291 00 $u Vol. 2 $v 1914-1944 #
41 311 00 $h London $j Allen &Unwin $k 1968 #
41 351 00 $j 268, (16) p. $j 24 cm. $k ill. ports. facsims #
41 468 00 $h Contains letters to and from Russell #
41 480 00 $h Contains index #

42 021 00 $h 04 921013 X $o £2.30 #
42 291 00 $u Vol. 3 $v 1944-1967 #
42 311 00 $h London $j Allen &Unwin $k 1969 #
42 351 00 $j 232 (16) p. $j 24 cm. $k ill. ports. facsims #
42 468 00 $h Contains letters to and from Russell #
42 480 00 $h Contains index #

CHARACTER SETS AND CHARACTER REPRESENTATION FOR THE EUDISED NETWORK

by

RÜDIGER BERNHARDT

Zentralstelle für maschinelle Dokumentation

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CHARACTER SETS AND CHARACTER REPRESENTATION FOR THE EUDISED NETWORK

Scope of the Study

The scope of the study was defined in Recommendation 3 of the first meeting of the Working Party (Report : DECS/Doc (72) 8).

The Recommendation called for a study to establish -

(a) the additional "enriched roman" character set required by the EUDISED network

(b) the representation of additional characters in 6 and 8-bit systems

(c) a general escape code mechanism for alternative alphabets.

Summary

The exchange of data within the EUDISED network requires a carrier system consisting of an exchange format and a defined character set. The study investigates the required extent of the EUDISED character set and offers facilities for the representation of a comprehensive character set.

The problem of creating the EUDISED character set has led to a search for suitable code systems and extension code mechanisms. For this ISO standards have been considered as a basis. The advantages and disadvantages of the code systems offered are discussed. The 7-bit ISO Code has been recommended for the EUDISED network.

As far as code escape mechanisms are concerned a range of theoretical and implemented code extension techniques are examined. The protype technique, which has been successfully used for some years in different applications, is proposed as the most suitable code extension method for the EUDISED network.

Furthermore, the choice of the EUDISED character set has taken into account the aspects of data recording, processing, printing and setting. The EUDISED format has been regarded as only one link within the long chain of working steps in the whole EUDISED network.

GENERAL CONSIDERATION OF CHARACTER SET PROBLEMS

Data processing consists of three essential elements :

- hardware
- software
- data

The efficiency of the hardware depends on the quality of the software.

The results of data processing, however, depend on the quality of the data to be processed. Data are an important and sensitive link in a computerized system. Data to be processed by computer are obtained by

- data recording, or through
- data exchange

Normally a computerized system consists of three main working steps :

- data recording
- data processing
- data output (printing, setting)

These working steps are performed by different machines :

- data recording machines (card punch, paper tape typewriter, magnetic tape typewriter and so on)
- computers
- printing or setting machines (rapid printer, linecasting or photosetting machines).

All these machines have substantially different founts of characters, depending on the type of machine. Thus the fount of characters offered by normal keyboarding machines ranges from 48 to 88 (116) visible characters, depending on the keyboard used. On the other hand, modern photosetting machines can set more than 1000 different characters in different type faces.

fount of characters:

input side	output side
48-88 (116) (recording)	64-192 (printing)
	90- approx. 350 (typesetting)
	90- approx. 1000 (photosetting)

As can be seen, there is no balance of character founts between the input and output sides of a computerized system. Now, the problem of defining a character set for data exchange purposes is to find a balance between existing hardware and user requirements in accordance with practical and economic considerations. Normally the fount of characters of the machines used is exactly defined but limited by hardware. However the situation changes completely where the character set of a format like the EUDISED format is concerned. Here the nature of the EUDISED character set is open-ended, which means it is impossible to define exactly in advance all the characters, graphics and symbols that might possibly occur in EUDISED material.

It means further that it is impossible to build up a permanent, complete and closed EUDISED character set suitable for all purposes. The creation of the EUDISED character set therefore depends on the following factors :

- hardware limitations
- imbalance of character sets on the input and output sides
- open-ended nature of the character set of the EUDISED material.

The only way to open the situation is to find practical methods which allow permanent adaptation of the EUDISED character set, even if hardware conditions or user requirements change.

The intention of the study is to introduce and discuss various possible solutions to enable the members of the Working Party to arrive at a well-balanced and qualified decision.

Character sets are represented by codes built up by bit strings or bit string combinations. The existing code situation should therefore firstly be reviewed.

ANALYSIS OF THE EXISTING CODES

At present there exists a wide range of different standardized and non-standardized codes. These codes have each been created in a certain environment to satisfy special needs. In fact people involved in standardization work find that there is such a huge number of arbitrary facts that despite best intentions and efforts, no fully satisfactory results can be obtained. Bearing this situation in mind the advantages and disadvantages of existing codes should be considered objectively to find the most suitable code for the EUDISED format.

All codes examined here have bit strings of defined fixed length. The codes contain graphic and control characters. The graphics represent particular alphabets and symbols. The controls are signals for transmission, print, devices, etc.

ISO 6-bit Code

This standardized code is built up by 6-bit strings and provides 64 coded characters.

The ISO 6-bit Code character set contains :

11 control characters
53 graphic characters
- 26 alphabet characters
- 10 numerals
- 17 other characters

64 characters

Character set table : ISO 6-bit Code

Bits b_6	b_5	b_4	b_3	b_2	b_1	Row \ Column	0	1	2	3
							0	0	1	1
							0	1	0	1
							0	1	2	3
0	0	0	0	0	0	0	SP	0	NUL	P
0	0	0	0	1	1	1	F_1 (HT)	1	A	Q
0	0	0	1	0	2	2	F_2 (LF) ①	2	B	R
0	0	0	1	1	3	3	F_3 (VT)	3	C	S
0	0	1	0	0	4	4	F_4 (FF)	4	D	T
0	0	1	0	1	5	5	F_5 (CR) ①	5	E	U
0	0	1	1	0	6	6	SO	6	F	V
0	0	1	1	1	7	7	SI	7	G	W
0	1	0	0	0	8	8	(	8	H	X
0	1	0	0	1	9	9	)	9	I	Y
0	1	0	1	0	10	: ①	*	: ①	J	Z
0	1	0	1	1	11	; ①	+	; ①	K	([) ①
0	1	1	0	0	12	<	,	<	L	(£) ② ①
0	1	1	0	1	13	= ①	—	= ①	M	(]) ①
0	1	1	1	0	14	>	.	>	N	ESC
0	1	1	1	1	15	?	/	?	O	DEL
								$ ①		
								%		
								&		
								'		

Advantages

(a) recommended by ISO
(b) compatible with the ISO-7 bit Code

Disadvantages

(a) limited fount of characters, 64 characters only
(b) capital letters only
(c) too few graphics
(d) not widely used

Recommendation

Because of its limitations the 6-bit Code should not be used in the EUDISED format.

BCD Code (Binary Coded Decimal Interchange Code)

This code is not standardized by an international body of standardization. BCD Code is an IBM code. Nevertheless the importance of this IBM code extends beyond IBM because other firms have adopted it. BCD Code is mainly employed in data recording (card punch), output devices and computers of the second generation such as IBM systems 1400 and 7000. Because of its world-wide application the BCD Code has the status of a quasi-standardized code. The BCD Code is built up from 6-bit strings and provides 64 coded characters.

The BCD Code character set contains:

9	control characters
55	graphic characters
	26 alphabet characters
	10 numerals
	19 other characters
64	characters

Advantages

(a) widespread application
(b) adopted by most computer manufacturers

Disadvantages

(a) limited fount of characters, 64 characters only
(b) capital letters only
(c) too few graphics
(d) only a quasi-standardized code
(e) different BCD character set tables for special devices (e.g. card punch or display devices)
(f) no control characters for escape code mechanism defined
(g) main application of the BCD Code is in the field of commercial data processing

Recommendation

Because of its disadvantages the BCD Code should not be used in EUDISED format.

Character set table : BCD Interchange Code

1 Collating Number	2 Graphics	3 Card Code			4 BCD Code						5
					B	A	8	4	2	1	
00	Blank	No Punches			No Bits						
01	.	12	3	8	B	A	8		2	1	
02	])	12	4	8	B	A	8				
03	[	12	5	8	B	A	8	4		1	
04	<	12	6	8	B	A	8	4	2		
05	§	12	7	8	B	A	8	4	2	1	GM
06	& +	12			B	A					
07	$	11	3	8	B		8		2	1	
08	*	11	4	8	B		8	4			
09	)	11	5	8	B		8	4		1	
10	;	11	6	8	B		8	4	2		
11	Δ	11	7	8	B		8	4	2	1	MC
12	-	11			B						
13	/	0	1			A				1	
14	,	0	3	8		A	8		2	1	
15	% (	0	4	8		A	8	4			
16	Y	0	5	8		A	8	4		1	WS
17	\	0	6	8		A	8	4	2		
18	∞	0	7	8		A	8	4	2	1	SM
19	↑		2	8		A					SB
20	≠ =		3	8			8		2	1	
21	@ '		4	8			8	4			
22	:		5	8			8	4		1	
23	>		6	8			8	4	2		
24	✓		7	8			8	4	2	1	TM
25	?	12	0		B	A	8		2		PZ
26	A	12	1		B	A				1	
27	B	12	2		B	A			2		
28	C	12	3		B	A			2	1	
29	D	12	4		B	A		4			
30	E	12	5		B	A		4		1	
31	F	12	6		B	A		4	2		
32	G	12	7		B	A		4	2	1	
33	H	12	8		B	A	8				
34	I	12	9		B	A	8			1	
35	!	11	0		B		8		2		MZ
36	;	11	1		B					1	
37	K	11	2		B				2		
38	L	11	3		B				2	1	
39	M	11	4		B			4			
40	N	11	5		B			4		1	
41	O	11	6		B			4	2		
42	P	11	7		B			4	2	1	
43	Q	11	8		B		8				
44	R	11	9		B		8			1	
45	↑	0	2	8		A	8		2		RM
46	S	0	2			A			2		
47	T	0	3			A			2	1	
48	U	0	4			A		4			
49	V	0	5			A		4		1	
50	W	0	6			A		4	2		
51	X	0	7			A		4	2	1	
52	Y	0	8			A	8				
53	Z	0	9			A	8			1	
54	0		0				8		2		
55	1		1							1	
56	2		2						2		
57	3		3						2	1	
58	4		4					4			
59	5		5					4		1	
60	6		6					4	2		
61	7		7					4	2	1	
62	8		8				8				
63	9		9				8			1	

Control Characters		Graphic	BCD Code	Card Code
GM:	Group Mark	‡	B-A-8-4-2-1	12-7-8
TM:	Tape Mark	√	8-4-2-1	7-8
SM:	Segment Mark	⇔	A-8-4-2-1	0-7-8
MC:	Mode Change	Δ	B-8-4-2-1	11-7-8
RM:	Record Mark	↑	A-8-2	0-2-8
SB:	Substitute Blank	↓	A	2-8
WS:	Word Separator	Y	A-8-4-1	0-5-8

Control Characters and Graphics

Character		Graphic	BCD Code	Card Code
MZ:	Minus Zero	!	B-8-2	11-0
PZ:	Plus Zero	?	B-A-8-2	12-0

Minus and Plus Zero

EBCDI Code (Extended Binary Coded Decimal Interchange Code)

This code is also an IBM code and it is not standardized by an international body of standardization. The EBCDI Code is mainly employed in the IBM systems 360 and 370 and other byte-oriented computers. Because of its world-wide application the EBCDI Code can also be interpreted as a quasi-standardized code.

The EBCDI Code is built up from 8-bit strings (the parity bit is a ninth) and provides for 256 coded characters, however, some bit strings remain unoccupied.

The EBCDI Code character set contains:

64 control characters
92 graphic characters
- 26 capital letters
- 26 lower case letters
- 10 numerals
- 30 other characters

100 free positions

256 characters

Advantages

(a) widespread application
(b) EBCDI Code is the internal code of byte-oriented computers
(c) extended graphic character set containing capital and lower case letters
(d) number of free positions

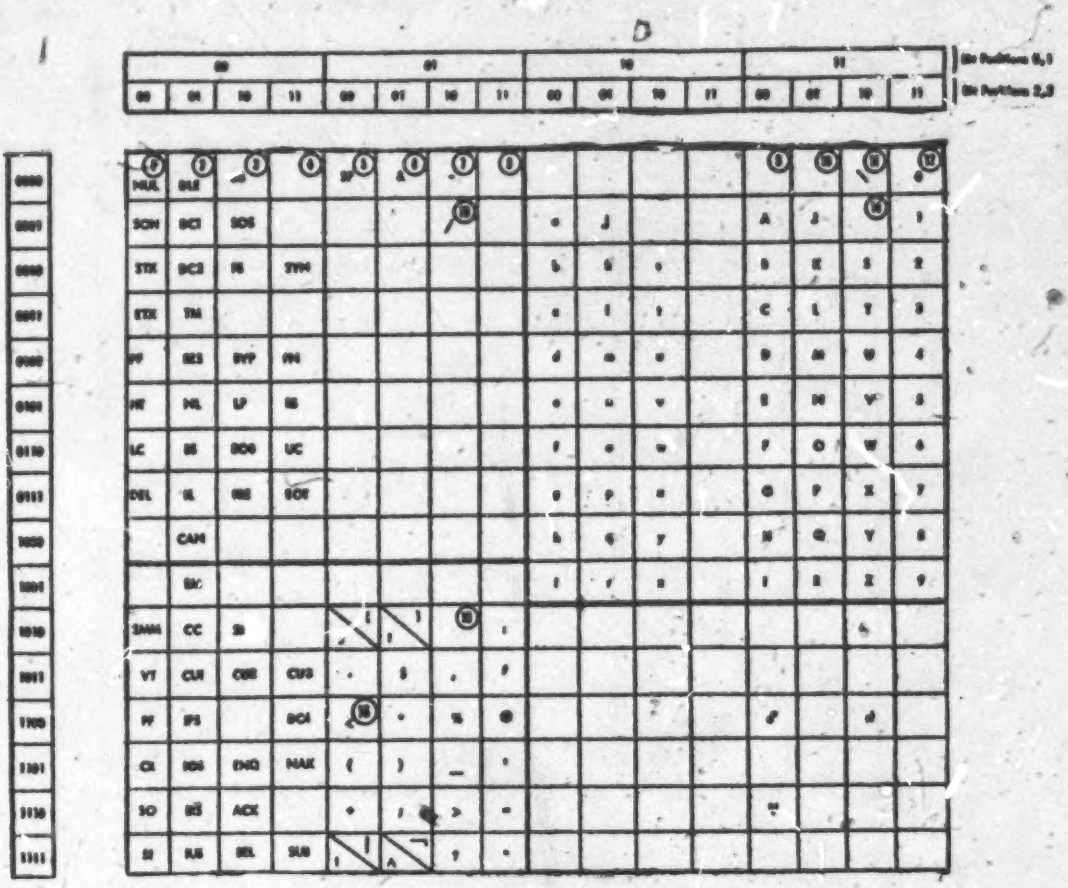
Disadvantages

(a) only a quasi-standardized code
(b) difficulties may occur and additional hardware facilities are needed if 7-track magnetic tapes are to be handled.
(c) the code is open to alteration dependent on the private policy of IBM

Recommendation

Because of its disadvantages the EBCDI Code should not be used in EUDISED format.

Character set table : EBCDI Code



Card Hole Patterns

(1) 12-0-9-8-1	(0) No Punches	(9) 12-0	(B) 0-1
(2) 12-11-9-8-1	(9) 12	(A) 11-0	(A) 11-0-9-1
(3) 11-0-9-8-1	(8) 11	(8) 0-9-8	(9) 12-11
(4) 12-11-0-9-8-1	(7) 12-11-0	(7) 0	

(B) On some data configurations, the hexadecimal (2E) is printed for this bit pattern, but this is nonstandard.

Control Character Representations

ACK	Acknowledge	EOT	End of Transmission	BS	Backspace		
BEL	Bell	ESC	Escape	IE	Idle		
BS	Backspace	ETB	End of Transmission Block	IR	Shift In		
BYP	Bypass	ETX	End of Text	SM	Set Mode		
CAN	Cancel	FF	Form Feed	SMM	Start of Manual Message		
CC	Cursor Control	FS	Field Separator	SO	Shift Out		
CR	Carriage Return	HT	Horizontal Tab	SOH	Start of Heading		
CU1	Customer Use 1	IFS	Interchange File Separator	SOS	Start of Significance		
CU2	Customer Use 2	IGS	Interchange Group Separator	SP	Space		
CU3	Customer Use 3	IL	Idle	STX	Start of Text		
DC1	Device Control 1	IRS	Interchange Record Separator	SUB	Substitute		
DC2	Device Control 2	IUS	Interchange Unit Separator	SYN	Synchronous Idle		
DC3	Device Control 3	LC	Lower Case	TM	Tape Mark		
DC4	Device Control 4	LF	Line Feed	UC	Upper Case		
DEL	Delete	NAK	Negative Acknowledge	VT	Vertical Tab		
DLE	Data Link Escape	NL	New Line				
EM	Right Select	NUL	Null				
EM	End of Medium	PF	Punch Off				
ENQ	Enquiry	PN	Punch On				

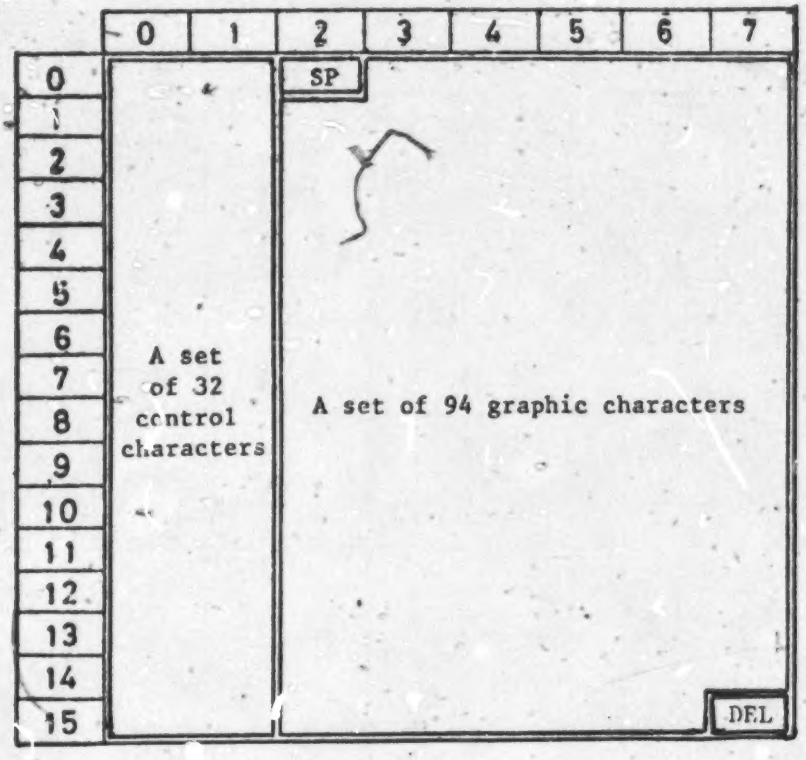
Special Graphic Characters

¢	Cent Sign	-	Minus Sign, Hyphen	#	Hash
.	Period, Decimal Point	/	Slash	@	Fork
<	Less-than Sign	,	Comma	'	Club
(	Left Parenthesis	%	Percent		
+	Plus Sign	_	Underscore		
|	Logical OR, Absolute	>	Greater-than Sign		
&	Ampersand	?	Question Mark		
!	Exclamation Point	:	Colon		
$	Dollar Sign	#	Number Sign		
*	Asterisk	@	At Sign		
)	Right Parenthesis	'	Prime, Apostrophe		
;	Semicolon	=	Equal Sign		
¬	Logical NOT	"	Quotation Mark		
[	Left Bracket	\	Backslash		
]	Right Bracket	A	Circumflex		

ISO 7-bit Code

This International Standard (ISO/R 646) is built up from 7-bit strings and contains a set of 128 characters. The character set takes into account the demands of graphics and controls in data transmission.

The 7-bit code consists of areas for a systematic set of control characters and graphic characters as follows:



The structure of the ISO 7-bit code

Advantages

(a) internationally agreed code for the interchange of information among data processing systems and associated equipment,

(b) contains facilities for character set extension when 128 characters are insufficient for particular applications

(c) not an internal code of an existing computer system, which means the code is computer independent,

(d) suitable for 7- and 9-track magnetic tapes

Disadvantages

(a) too few graphics, e.g. no diacritics

Recommendation

Obviously the ISO 7-bit Code offers the best facilities for the EUDISED network. Its usage in EUDISED format should be seriously considered.

Character set table : ISO 7-bit Code

b_7	b_6	b_5	b_4	Column → / Row ↓	0	1	2	3	4	5	6	7
					0	0	1	1	0	0	1	1
					0	1	0	1	0	1	0	1
0	0	0	0	0	NUL	(TC_1)DLE	SP	0	(@) ⑤	P	` ⑨	p
0	0	0	1	1	(TC_2) SOH	DC_1	!	1	A	Q	a	q
0	0	1	0	2	(TC_3) STX	DC_2	" ⑤	2	B	R	b	r
0	0	1	1	3	(TC_4) ETX	DC_3	£ ③ ⑦	3	C	S	c	s
0	1	0	0	4	(TC_5) EOT	DC_4	$ ③	4	D	T	d	t
0	1	0	1	5	(TC_6) ENQ	(TC_7)NAK	%	5	E	U	e	u
0	1	1	0	6	(TC_7) ACK	(TC_8)SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	(TC_{10})ETB	' ⑤	7	G	W	g	w
1	0	0	0	8	FE_0 (BS)	CAN	(	8	H	X	h	x
1	0	0	1	9	FE_1 (HT)	EM	)	9	I	Y	i	y
1	0	1	0	10	FE_2 (LF) ⑥	SUB	*	: ⑤	J	Z	j	z
1	0	1	1	11	FE_3 (VT)	ESC	+	; ⑤	K	([) ④	k	⑩
1	1	0	0	12	FE_4 (FF)	IS_4 (FS)	,	<	L	⑤	l	⑩
1	1	0	1	13	FE_5 (CR) ⑥	IS_3 (GS)	-	=	M	(]) ④	m	⑩
1	1	1	0	14	SO	IS_2 (RS)	.	>	N	^ ④ ⑤	n	¯ ② ⑩
1	1	1	1	15	SI	IS_1 (US)	/	?	O	_	o	DEL

Controls

ACK	Acknowledge	GS	Group Separator
BEL	Bell	HT	Horizontal Tabulation
BS	Backspace	IS	Information Separator
CAN	Cancel	LF	Line Feed
CR	Carriage Return	NAK	Negative Acknowledge
DC	Device Control	NL	New Line
DEL	Delete	NUL	Null
DLE	Data Link Escape	RS	Record Separator
EM	End of Medium	SI	Shift-in
ENQ	Enquiry	SO	Shift-out
EOT	End of Transmission	SOH	Start of Heading
ESC	Escape	SP	Space
ETB	End of Transmission Block	STX	Start of Text
ETX	End of Text	SUB	Substitute
F	Function	SYN	Synchronous Idle
FE	Format Effector	TC	Transmission Control
FF	Form Feed	US	Unit Separator
FS	File Separator	VT	Vertical Tabulation

8-bit LC (Library of Congress) Extension Code

This code has been developed by the Library of Congress for general interchange of bibliographic information among libraries. The 8-bit LC Extension Code is obtained by addition of one bit to each of the bit combinations of the 7-bit ASCII (American Standard Code for Information Interchange) and provides for 256 coded characters.

ASCII is virtually identical with the ISO 7-bit code.

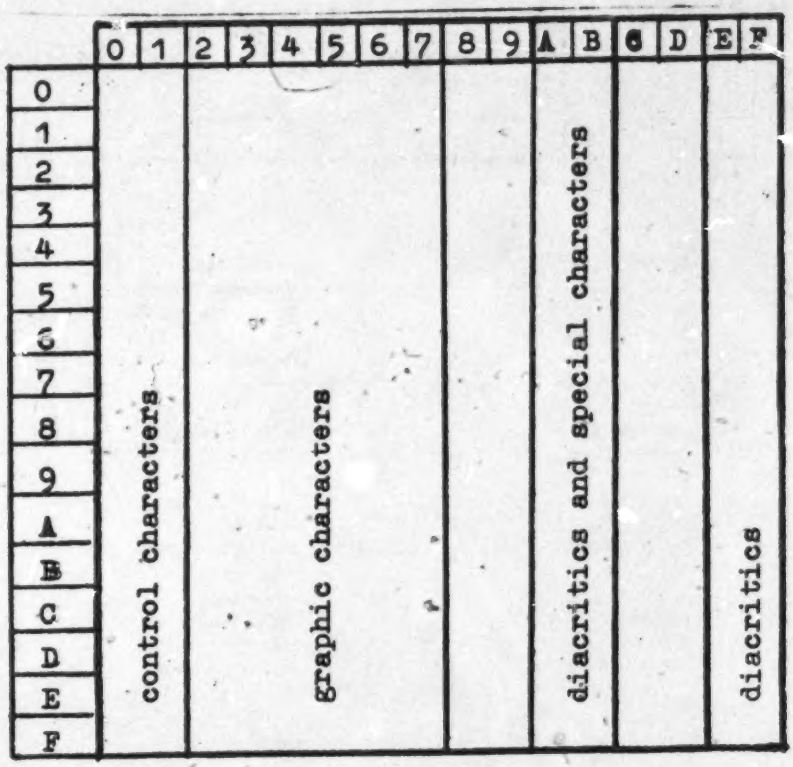
The 8-bit LC Extension Code character set contains:

32 control characters
152 graphic characters
- 26 capital letters
- 26 lower case letters
- 10 numerals
- 90 others, including diacritics

72 free positions

256 characters

The 8-bit LC Code consists of areas for systematic sets of control characters, graphic characters, special characters and diacritical marks as follows:



The structure of the 8-bit LC Code

Character set table : 8-bit LC Extension Code

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p								
1	SOH	DC1	!	1	A	Q	a	q								
2	STX	DC2	"	2	B	R	b	r								
3	ETX	DC3	#	3	C	S	c	s								
4	EOT	DC4	$	4	D	T	d	t								
5	ENQ	NAK	%	5	E	U	e	u								
6	ACK	SYN	&	6	F	V	f	v								
7	BEL	ETB	'	7	G	W	g	w								
8	BS	CAN	(	8	H	X	h	x								
9	HT	EM	)	9	I	Y	i	y								
A	LF	SUB	*	:	J	Z	j	z								
B	VT	ESC	+	;	K	[	k	{								
C	FF	FS	,	<	L	\	l	|							
D	CR	GS	-	=	M	]	m	}								
E	SO	RS	.	>	N	^	n	~								
F	SI	US	/	?	O	_	o	DEL								

Advantages

(a) extended graphic character set containing capital letters, lower case letters and diacritical marks
(b) the ISO 7-bit Code is an integral part of the 8-bit LC Code, no characters have been substituted in the standard set
(c) contains facilities for extension to additional sets
(d) not an internal code of an existing computer system, which means this code is computer independent
(e) considerable number of free positions in the extended area

Disadvantages

(a) only a quasi-standardized code
(b) the 8-bit string code normally requires 9-track magnetic tapes for information interchange, otherwise difficulties will occur if 7-track magnetic tapes are to be handled
(c) suitable for 9-track magnetic tapes only
(d) mainly intended for the interchange of bibliographic data and needs of foreign languages

Scientific symbols such as

¬	negation	≥	not less than
≡	equivalence	≤	not greater than
∧	conjunction	∞	infinity
∨	disjunction	→	implication right

and others do not occur in the 8-bit LC Code.

(e) subscript, superscript, Greek, Cyrillic characters are not available in the standard 8-bit set

Recommendation

The 8-bit LC Code seems to be a good alternative to the ISO 7-bit Code, and has also been previously recommended. However, the 8-bit LC Code is a non-standard code and its character set philosophy is influenced by general library needs, which are not necessarily the same as those of the EUDISED documentation network.

Tabular summary

	ISO 6-bit	BCD	EBCDIC	ISO 7-bit	8-bit LC
graphics	53	57	92	94	150
controls	11	7	64	34	34
free positions	-	-	100	-	72
fount	64	64	256	128	256

This examination of the code situation has shown :

- the number of characters in a given code is subject to hardware limitation
- the character set in a given code is influenced by particular applications
- some codes contain unoccupied positions
- there is no code available that completely fulfills the demands of the EUDISED network.

Further alternatives should now be considered to find the way out to a practical solution.

Such alternatives are :

1. Creation of a new code corresponding to EUDISED format needs
2. Use of existing codes extended by additional characters which occupy the existing free positions of the code
3. Use of an existing and standardized code combined with code extension facilities.

Before a new code is created for the EUDISED format the following aspects have to be considered :

- the EUDISED material requires a comprehensive character set
- the open-ended nature of the EUDISED character set does not allow the adoption of a closed character set table
- technical and economic aspects have to be considered if the demands of the EUDISED character set make additional bit strings necessary
- the creation of a new non-standardized code can lead to an isolated situation if hardware conditions change. This could have severe consequences for the code and the EUDISED network
- there is no real chance that a newly created individual EUDISED format code will be approved by an international body of standardization.

In short, the creation of an individual EUDISED format code is not to be recommended. The results to be gained from this line of development do not justify the effort involved.

Considering the next proposal, to use an existing code modified by additional characters occupying the free positions of the code, the following problems occur:

- there are insufficient free positions in the existing codes to satisfy the requirements of a comprehensive EUDISED character set
- insertion of new characters in an existing code creates an individual code. Individual codes are not protected against hardware alterations.

Thus the method of occupying free positions of an existing code cannot be recommended because of its resulting character set limitations and because of the risk of conflict between technical developments and individual extended codes.

The best method of solving the EUDISED code problems seems to be the introduction of a standardised code and a code extension mechanism, because :

- a standardized code guarantees that hardware alterations can only be made in conformity with the standard stipulations
- by using suitable code extension techniques the problem of the open-ended EUDISED character set can be solved.

ANALYSIS OF EXISTING CODE EXTENSION TECHNIQUES

At present there exists no standard for escape code techniques. However, certain code extension techniques have been proposed in a new draft standard ISO/DIS 2022. In addition, the protype code extension technique should be considered.

Extension by Substitution

With this method some of the characters of the basic code are replaced by substitute characters. This comparatively simple method cannot be recommended for the EUDISED format because of the limitations and disadvantages mentioned above.

Extension by Use of the Free Codes

This method works by filling the free positions of the basic code with further characters. Extension in this case is limited by the number of free code positions and leads to a new non-standardized code, but not to a comprehensive character set.

Extension by Increasing the Repertoire of Characters

This method works with a shift-out/shift-in mechanism, which allows the temporary substitution and replacement of complete graphic or control character sets. This mechanism requires different control characters from the standard character set.

(a) The control character Shift-out (SO) alters the meaning of the bit combinations of columns 2 to 7 (see page 100) which follow it and offers an additional set of 94 graphic characters (e.g. the Greek alphabet)

(b) The control character Shift-in (SI) reinstates the standard meaning of the bit combinations of columns 2 to 7 which follow it and replaces the standard character set.

(for more details see ISO/DIS 2022)

By using multiple shift-out sets any non-Roman alphabet or special character set can be represented by this extension method. However, the disadvantages of this method are :

- at present it is only at the draft stage and not implemented in a computerized system
- non-Roman alphabet tables (e.g. Greek, Cyrillic) and special character set tables have not yet been defined and standardized by an international body
- additional character set tables may give rise to sorting problems, thus increasing programming costs
- further problems occur during the stage of data recording. Data recording and proof-reading personnel have to handle additional character set tables.

Extension by Escape Sequences

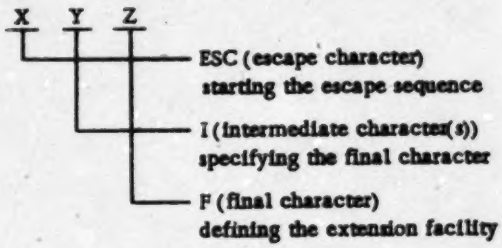
Escape sequences provide single or sets of control and graphic characters. An escape sequence consists of two or more 7-bit combinations to announce the code extension facilities utilised in the data which follow.

Such extension facilities can be

- a single control character not already in the code
- a set of control characters not already in the code
- a set of graphic characters not already in the code
- a code structure different from the code

and so on.

The escape sequence is built up as follows :



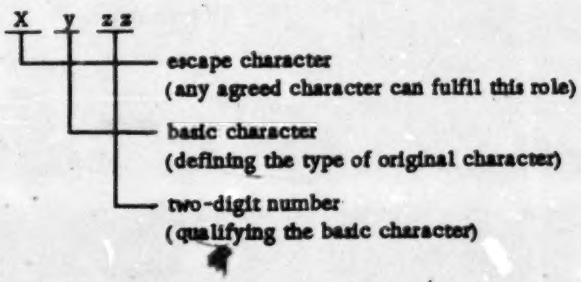
(for more details see ISO/DIS 2022)

The escape sequence mechanism proposed in ISO/DIS 2022 offers various code extension facilities. However, this method seems to have been devised without due consideration being given to practical aspects, because its handling during data recording and data processing is rather sophisticated. Obviously this method is at the initial stage of development and should be tested and improved by practical application, but not by the EUDISED network.

Extension by Protypes

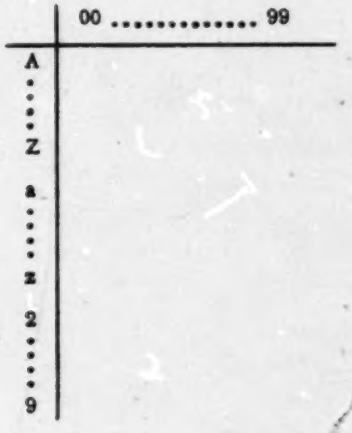
This method has been developed by ZMD (Zentralstelle für maschinelle Dokumentation, Germany) which was forced to find a method for handling comprehensive character founts in data recording and computer typesetting. Protypes supplant the original characters during certain working steps (e.g. data recording, data exchange). After data processing protypes can be replaced by their original characters and printed by modern photosetting machines, if available.

Seen in detail protypes have the following form :



A 'basic character' is defined as a normal character of the Roman alphabet within the range A to Z, a to z, 0 to 9 used in conjunction with an escape code to represent a character otherwise not available in the character set.

The potential capacity of protypes is approximately 6000 character representations. The basis for this figure can be understood by envisaging a grid of



A full description of the system is contained in Typen und Protypen für den Fotosatz mit der Linotron 505 (ZMD-A-22).

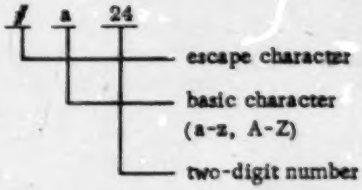
There are three types of protypes :

1. diacritics

e.g. original character

â

Protype

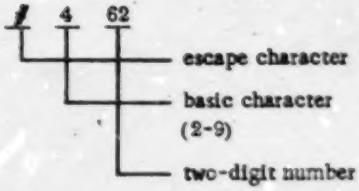


2. special characters

e.g. original character

∞

Protype

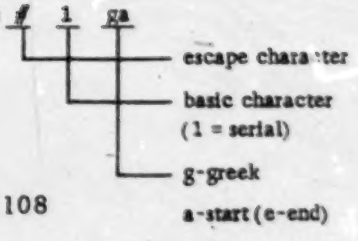


3. control characters

e.g. function

start of Greek characters

Protype



Superscript and Subscript facilities

Each character and protype can be represented in superscript and subscript position by using the following functions

superscript	function
X^{a}	# lhn
X^{a}	# lhh
X^{a}	# lht

subscript	function
X_{a}	# ltn
X_{a}	# lth
X_{a}	# ltt

example :

X^{a}	X#lhna
X_{2a}	X#ltn2a

(for more details see Typen und Protypen für den Fotosatz mit der Linotron 505 (ZMD-A-22))

Disadvantages

- The application of protypes requires additional effort and expense at the stage of data recording and proof-reading. However, experience has shown that data recording and proof-reading personnel have gained within a short while a complete command of the protypes. The principle of representation of protypes - basic character and two-digit number - keeps the word recognisable by means of the basic character which gives a good clue to the proof-reader
- The application of protypes leads inevitably to more sophisticated and more comprehensive programs, because extended tables have to be stored and complicated character combinations have to be processed instead of simple character sequences (e.g. protypes as indices)
- The punching of one protype requires four keystrokes instead of one. This leads furthermore to an extended quantity of data

Advantages

- Each protype appears as a quasi-standardized escape sequence of fixed length (a four x 7-bit combination)
- Protypes provide a potential escape mechanism, which extends from the lower level of typewriters to the comprehensive character sets offered by photosetting machines
- Protypes are defined in systematic tables which are arranged in a grid as a formalized character set system

excerpt from the Protype grid

basic character	diacritic (symbolized by a two-digit number)													
	´	`	^	¨	~	˘	˚	˛	ˇ	¯	˙	˝	˙	h
	22	23	24	25	26	27	28	29	32	33	34	35	36	37
a	á	à	â	ä	ã	ă		ą	ǎ	ā		å	ȧ	aʰ
b														
c	ć		ĉ			č	ċ							
d						đ	ď						ḋ	
e	é	è	ê	ë	ẽ	ĕ			ě	ē			ė	
f													ḟ	
g	ǵ		ĝ				ġ		ǧ	ḡ	ğ		ġ	
h			ĥ											
i	í	ì	î	ï	ĩ	ĭ			ǐ	ī			ı	

examples :

original character	Protype
á	/a22
ć	/c22
ẽ	/e25

- The protypes defined at present cover all characters needed in :

	Danish	Icelandic	Romanian
	German	Italian	Swedish
	English	Croat	Slovakian
	Esperanto	Latvian	Slovenian
	Estonian	Lithuanian	Spanish
	Finnish	Norwegian	Czech
	Flemish	Portuguese	Turkish
	French	Polish	Hungarian
	Dutch		
and	Bulgarian	Russian	Ukrainian
	Macedonian	Serbian	White Russian

- The system is quasi open-ended and further diacritics may be added, any corresponding basic character with its two-digit number already having its fixed position
- The total character fount that can be reached by using the protype technique comes to nearly 6000 different characters (including superscript and subscript)
- This gigantic character fount can be recorded by normal paper tape or magnetic tape typewriters by using the protype technique
- At present nearly 800 protypes are defined and the large number of free positions can be occupied in accordance with future user requirements
- Protypes conform to different levels of sophistication of recording or setting machines used in the EUDISED network
- Protypes can be used in combination with any code system, they already conform to each existing code system
- Protypes can be changed, added or suppressed simply by user agreement, without technical considerations intervening
- The structure of protypes allows application-dependent usage without preventing the interchange of the data to which they are applied
- Protypes are adaptable to new developments
- Protypes are compatible with the character sets of all other formats
- Protypes can be sorted by computer in any required manner (e.g. for diacritics, sorting only on the basic characters etc.).

Protypes have been successfully used since 1968 in mechanized systems, including

- South African National Bibliography
- Food Science and Technology Abstracts
- Romanistische Bibliographie
- Deutsche Bibliographie

This means that a total of 150,000 titles have been recorded using the protype technique. The experience gained has been very encouraging.

Example : Data recording with protypes

(Romanistische Bibliographie)

```
□
10  68-14309
20  b-6538
30  Cassagnau, M.:
40  Mots curieux §a23 titres divers.
60  3814-69 (1968) 358-365.
□
10  68-14310
20  b-6538
30  Cassagnau, M.:
40  Glanes de philologie gasconne.
60  3814-68 (1967) 133-144; 280-284;
    69 (1968) 241-247.
□
```

10 68-14320
20 b-6621
30 Combarnous, G.:
40 Le suffixe §431anicum§431 en pays d'oc.
60 1336-20 (1968) 62.
□
10 68-14321
20 b-6621
30 Combarnous, G.:
40 Le toponyme proven§c49al Callepa et l'indo-europ§e22en □lep-□ §431§e22caler§431.
60 1336-20 (1968) 61-62.
□
10 68-14322
20 b-6521
30 Ziino, A.:
40 Alcune osservazioni sul testo musicale dello §431Sponsus§431.
60 1121-27 (1967) 109-119.
□
10 68-14323
20 b-6538
30 Vintil§a32-R§a32dulescu, I.:
40 Sur le traitement des sonantes en gascon.
60 1339-13 (1968) 83-88.
□
10 68-14324
20 b-5703; b-8703; b-0703
30 Dubsk§y22, J.:
40 El aspecto estil§i22stico de un fen§o22meno lingü§i22stico.
60 1302-10 (1967) 21-28.
□
10 68-14325
20 b-5940
30 Kirk-Greene, A. H. M.:
40 French in Africa.
60 1256-48 (1967) 74-76.
□
10 68-14326
20 b-5221
30 Delattre, P.; Monnot, M.:
40 The role of duration in the identification of French nasal vowels.
60 1170-6 (1968) 267-288.
□
10 68-14327
20 b-5272
30 Valdman, A.:
40 Norme p§e22dagogique: Les structures interrogatives du Fran§c49ais.
60 1170-5 (1967) 3-10.
□

PROPOSED EUDISED FORMAT CODE AND CODE EXTENSION TECHNIQUE

Following the reasoning outlined above, the EUDISED format exchange code should be the ISO 7-bit Code as described in ISO/R 646 in combination with the PROTYPE code extension technique because :

- the ISO 7-bit Code is the internationally agreed code for the general interchange of information
- the protype code extension technique is at present the most successful, as has been proved in practice over a considerable period. Protypes best conform to the requirements of the EUDISED format.

PROPOSED EUDISED FORMAT CHARACTER SET

The EUDISED format character set should contain

1) alphabets : Roman
   Greek
   Cyrillic

2) diacritics covering all languages mentioned on page 110

3) mathematical and related symbols including the fractions :

1/2	1/3	2/3							
1/4	3/4	1/5	2/5	3/5	4/5				
1/6	5/6	1/7	2/7	3/7	4/7	5/7	6/7		
1/8	3/8	5/8	7/8	1/9	2/9	4/9	5/9	7/9	8/9

4) Superscript and subscript facilities

5) Facilities for bold, italic and bold italic type faces.

PROPOSED EUDISED CHARACTER SET REDUCTION MECHANISM

It may happen that a potential user cannot participate fully in the EUDISED network because of restricted hardware or some other limitation. For these users a second version of the EUDISED data, represented by a reduced character set, should be prepared by computer.

This reduced character set should contain only :

Capital letters	A to Z	
Numerals	0 to 9	
Special characters	. , - / = + ( ) * $ '	
	; [ ] : % "	

All other EUDISED characters should be represented as follows :

diacritics		basic character only
e.g. â	⟶	a
ë	⟶	e

Greek (single characters only)		long written form
e.g. α	⟶	ALPHA
γ	⟶	GAMMA
maths symbols		**long written form**
e.g. ∞	⟶	INFINITY
≡	⟶	EQUIVALENCE

In order to achieve a wide EUDISED network the application of a character set reduction mechanism should be seriously considered.

CONCLUSION

It should be realised that a mechanised system consists of mechanized and manual working steps. Each step is influenced by the other.

The EUDISED network also represents a mechanised system. The EUDISED format is, in the same way, to be regarded as only one link within the long chain of working steps. Therefore format structure, contents and character set have to be carefully taken into account because of their effect on other working steps such as:

data recording

data processing

data output (printing, setting)

The character set and the code extension mechanism proposed in this study follow this philosophy.

The demands of data recording have been satisfied by the introduction of protypes, a successful escape technique, which covers also the full range of data output facilities from computer printout to the high quality output of photosetting machines.

The study has laid stress on the aspect of complexity and sought to find an appropriate solution to the problems involved.

POSTSCRIPT

A draft of this study was examined by the EUDISED Working Party on Formats and Standards at its third meeting (Luxembourg, April 1973). The Working Party felt that the proposal in the study to combine the ISO 7-bit code with extension by protypes "seemed to offer a good interim solution which would provide interface between sophisticated input facilities and handling by less sophisticated systems". Furthermore the Working Party decided to forward the study to international experts in this field for further comment.

The author has since received comments from Mr. Gunnar Sundblad, Chairman of ISO WG 1 in TC 46/SC4, Dr. Karl P. Stock, Vienna and from Dr. Walter Koch, Graz. The author wishes to thank all experts for their comments and for the hard work which their examination of the study involved. In essence the experts agreed with the recommendation to use the ISO 7-bit code, but disagreed with the author's recommendation of the protype technique for code extension. At the fourth meeting, in Strasbourg, there was a final discussion on the study. Mr. Sundblad, who was also present at the meeting, emphasized that protypes should be not used in the EUDISED network as the protype technique is not standardized. The majority of the Working Party followed the arguments of Mr. Sundblad. It therefore recommended the adoption of the ISO 2022 procedures for extending character sets.

The author must admit that he can offer no actual evidence of the inferiority in practice of ISO 2022 to the protype method, since even Mr. Sundblad has been at a complete loss to report any operational application of ISO 2022.

Rüdiger BERNHARDT

August 1973

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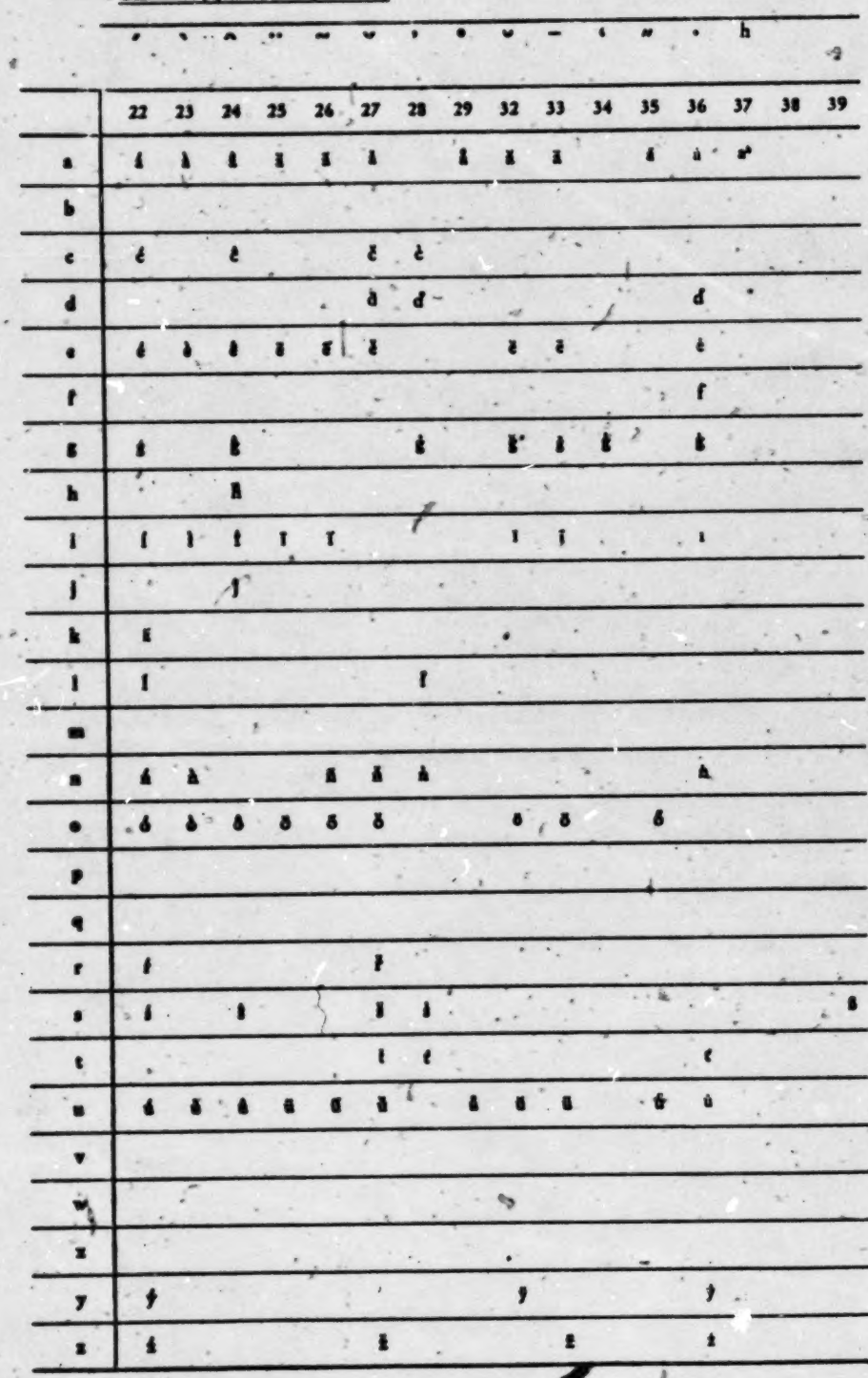
Zschel, Horst; "Das Problem des Zeichenvorrats", p. 154-161 in: Schneider, K. (Hrsg.) die ZMD in Frankfurt am Main, Berlin (u.a.): Beuth, 1969, 208 p.

APPENDIX

PROTYPE REPRESENTATION OF THE PROPOSED

EUDISED FORMAT CHARACTER SET

Diacritics (systematically ordered)



Diacritics (systematically ordered)

	42	43	44	45	46	47	48	49	52	53	54	55	56	57	58	59
a				ɐ			ɑ̟		ɑ̠							
b																
c							ɕ	ʑ								
d		ɗ	ɗ				ɖ				ɗ		ɖ			
e									ɤ̟	ɤ̠						
f																
g																
h							ɦ				ɦ	ɦ				
i									i̟	i̠						
j																
k							ɬ	ɬ		ʞ						
l	l						ɭ	ɭ					l			
m																
n							ɳ	ɳ					ɳ			
o	ɵ			ɶ				ɵ								
p			ɸ				ɸ									
q																
r							ɾ	ɾ							ɾ	
s							ʂ	ʂ								
t							ʈ	ʈ			ʇ		ʇ			
u									ɯ̟	ɯ̠						
v																
w																
x																
y																
z							ʐ									

Diacritics (systematically ordered)

	22	23	24	25	26	27	28	29	32	33	34	35	36	37	38	39
A	Á	À	Â	Ä	Ã			Å	Ā	Ă		Ą	Ǻ			
B																
C	Ć		Ĉ			Ċ										
D						Ď										
E	É	È	Ê	Ë		Ē			Ę	Ě			Ė			
F													Ḟ			
G	Ǵ		Ğ						Ģ				Ġ			
H			Ȟ													
I	Í	Ì	Î	Ï					Į	İ			İ			
J			Ĵ													
K	Ḱ															
L	Ĺ						Ł									
M																
N	Ń				Ñ	Ņ	Ň						Ṅ			
O	Ó	Ò	Ô	Ö	Õ				Ő	Ǫ		Ø				
P																
Q																
R	Ŕ					Ŗ										
S	Ś		Ş			Š										
T						Ţ										
U	Ú	Ù	Û	Ü		Ū		Ů	Ű	Ų		Ư				
V																
W																
X																
Y	Ý								Ÿ				Ỳ			
Z	Ź					Ž							Ż			

Diacritics (systematically ordered)

	42	43	44	45	46	47	48	49	52	53	54	55	56	57	58	59
A				Æ					Ą							
B																
C								Ç								
D		Đ									D		Ḍ			
E									Ę							
F																
G								Ģ								
H							Ḥ					Ḫ				
I									Į							
J																
K							Ḳ	Ķ								
L	Ł							Ļ					Ḷ			
M																
N							Ṇ	Ņ					Ṉ			
O	Ø			Œ				Ǫ								
P			Þ													
Q																
R							Ṛ	Ŗ								
S							Ṣ	Ş								
T								Ţ			Ṭ		Ṯ			
U									Ų							
V																
W																
X																
Y																
Z																

Diacritics (alphabetically ordered)

á	a22	Á	A22	é	e36	É	E36
à	a23	À	A23	ę	e52	Ę	E52
â	a24	Â	A24	ę	e53		
ă	a25	Ă	A25				
ä	a26	Ä	A26	f	f36	F	F36
ã	a27						
ą	a29	Ą	A29	ģ	g22	Ģ	G22
ā	a32	Ā	A32	ĝ	g24	Ĝ	G24
ă	a33	Ă	A33	ğ	g28		
å	a35	Å	A35	ġ	g32	Ġ	G32
ą	a36	Ą	A36				
a'	a37			ģ	g33		
æ	a45	Æ	A45	ģ	g34		
ą	a48			ģ	g36	Ģ	G36
ą	a52	Ą	A52			Ģ	G49
ć	c22	Ć	C22	ħ	h24	Ħ	H24
ĉ	c24	Ĉ	C24	ḥ	h48	Ḥ	H48
č	c27	Č	C27	ḥ	h54		
ć	c28			ḥ	h55	Ḥ	H55
ç	c48						
ç	c49	Ç	C49	ı	122	I	I22
				ı	123	I	I23
ď	d27	Ď	D27	ı	124	I	I24
đ	d28			ı	125	I	I25
đ	d36			ı	126		
đ	d43	Đ	D43	ı	132	I	I32
ð	d44			ı	133	I	I33
đ	d48			ı	136	I	I36
đ	d54	Đ	D54	ı	152	I	I52
đ	d56	Đ	D56	ı	153		
é	e22	É	E22	ĵ	j24	J	J24
è	e23	È	E23				
ê	e24	Ê	E24	ķ	k22	K	K22
ë	e25	Ë	E25	ķ	k48	K	K48
ë	e26			ķ	k49	K	K49
ë	e27	Ë	E27				
ë	e32	Ë	E32	ł	122	L	L22
ë	e33	Ë	E33	ł	128	Ł	L28

Diacritics (alphabetically ordered)

ł	l42	Ł	LA2	ś	s27	Ś	S27
ł	l48			ś	s28		
ł	l49	Ł	LA9	ś	s39		
ł	l56	Ł	L56	ś	s48	Ś	S48
				ś	s49	Ś	S49
ń	n22	Ń	N22				
ń	n23			ť	t27	Ť	T27
ń	n26	Ń	N26	ť	t28		
ń	n27	Ń	N27	ť	t36		
ń	n28	Ń	N28	ť	t48		
ń	n36	Ń	N36	ť	t49	T	T49
ņ	n48	Ņ	N48	ť	t54	T	T54
ņ	n49	Ņ	N49	ť	t56	T	T56
ņ	n56	Ņ	N56				
				ú	u22	Ú	U22
ó	o22	Ó	022	ù	u23	Ù	U23
ò	o23	Ò	023	û	u24	Û	U24
ô	o24	Ô	024	ü	u25	Ü	U25
ő	o25	Ő	025	ű	u26		
õ	o26	Õ	026	ů	u27	Ů	U27
ö	o27			ů	u29	Ů	U29
ō	o32	Ō	032	ū	u32	Ū	U32
ō	o33	Ō	033	ū	u33	Ū	U33
ō	o35	Ō	035	ų	u35	Ų	U35
ø	o42	Ø	042	ų	u36		
œ	o45	Œ	045	ų	u52	Ų	U52
ǫ	o49	Ǫ	049	ų	u53		
þ	p44	Þ	P44	ý	y22	Ý	Y22
þ	p48			ÿ	y32	Ÿ	Y32
				ÿ	y36	Ÿ	Y36
ŕ	r22	Ŕ	R22				
ř	r27	Ř	R27	ź	z22	Ź	Z22
ŗ	r48	Ŗ	R48	ž	z27	Ž	Z27
ŗ	r49	Ŗ	R49	ż	z33		
ŗ	r58			ż	z36	Ż	Z36
				ż	z48		
ś	s22	Ś	S22				
ś	s24	Ś	S24				

Special characters

.	320
,	321
:	322
;	323
!	324
?	325
-	326
=	327
/	328
'	329
"	330
`	331
^	332
~	333
¨	334
¯	335
¡	
¿	

(	420
)	421
[	422
]	423
{	424
}	425
<	426
>	427
«	428
»	429
::	430
→	431
←	432
↔	433
↑	434
↓	435
⇒	436
⇔	437
∫	440
∮	441
∯	442

≤	520
≥	521
≠	522
≈	523
≪	524
≫	525
∀	526
∃	527
∄	528
∈	529
∉	530
∋	531
∌	532
⊂	533
⊃	534
⊄	535

°	340
¦	341
‖	342
¬	343
¯	344
ª	345
º	346
‰	347
‱	348

±	460
∓	461
∗	462
∝	463
∔	464
∼	465
∸	466
∎	467
○	468
□	469
△	470
◦	471
⊖	472
∅	473
⌂	474

::	560
∔	561
∗	562
∝	563
∼	564
∸	565
∎	566
●	567
■	568
▲	569
▼	570
◆	571

+	360
‹	361
•	362
‡	363
%	364
	365
∎	366
$	367
£	368
♣	369
♠	370
♥	371
●	372
□	373
#	374
×	375
⊥	376
	377
†	378
‡	379

ℱ	480
ℊ	481
∂	482
ℏ	483

⊕	380
⊖	381
⊕	382
⊖	383
⊗	384
⊙	385

Greek alphabet

basic character	two-digit number 63
a	α
b	β
c	
d	δ
e	ε
f	φ
g	γ
h	θ
i	ι
j	η
k	κ
l	λ
m	μ
n	ν
o	ο
p	π
q	ξ
r	ρ
s	σ
t	τ
u	υ
v	
w	ω
x	χ
y	ψ
z	ζ

basic character	two-digit number 63
A	Α
B	Β
C	
D	Δ
E	Ε
F	Φ
G	Γ
H	Θ
I	Ι
J	Η
K	Κ
L	Λ
M	Μ
N	Ν
O	Ο
P	Π
Q	Ξ
R	Ρ
S	Σ
T	Τ
U	Υ
V	
W	Ω
X	Χ
Y	Ψ
Z	Ζ

Cyrillic alphabet

basic character	two-digit number	
	73	74
a	а	ѓ
b	в	ь
c	с	є
d	д	ђ
e	е	ё
f	г	ґ
g	б	ћ
h	н	њ
i	і	ї
j	ј	э
k	к	ќ
l	л	љ
m	м	ж
n	п	ю
o	о	ѳ
p	р	ч
q	ц	ф
r	я	
s	ѕ	
t	т	ћ
u	и	й
v	ѵ	џ
w	ш	щ
x	х	ы
y	у	ў
z	з	ъ

basic character	two-digit number	
	73	74
A	А	Ѓ
B	В	Ь
C	С	Є
D	Д	Ъ
E	Е	Ё
F	Г	Ґ
G	Б	Ћ
H	Н	Њ
I	І	Ї
J	Ј	Э
K	К	Ќ
L	Л	Љ
M	М	Ж
N	П	Ю
O	О	Ѳ
P	Р	Ч
Q	Ц	Ф
R	Я	
S	Ѕ	
T	Т	Ћ
U	И	Й
V	Ѵ	Џ
W	Ш	Щ
X	Х	Ы
Y	Ү	Ў
Z	З	Ъ